Vol. VII. DECEMBER, 1917. No. 12.

AMERICAN JOURNAL of PUBLIC HEALTH

THE JOURNAL OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

Acute Contagious Diseases in the French Army
Surgeon Major E. Riet

U. S. Public Health Service and the War
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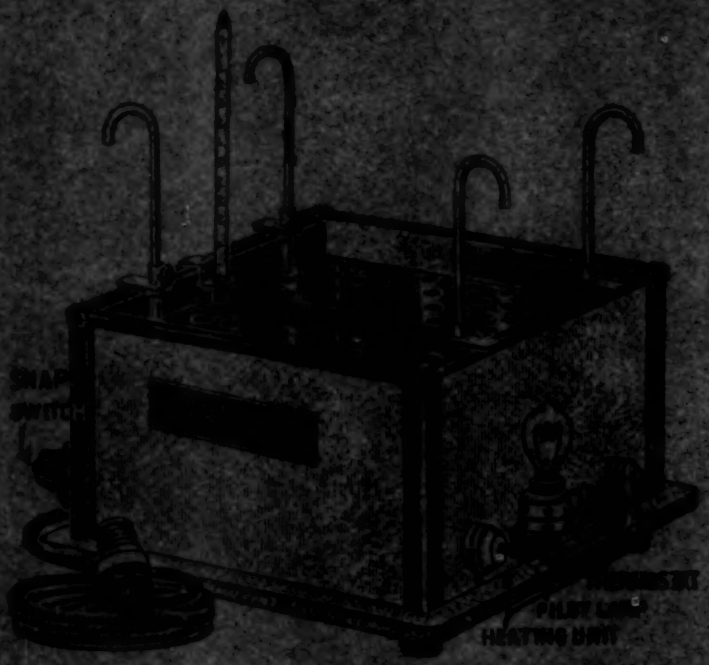
NOTICE TO SUBSCRIBERS

PUBLISHED MONTHLY AT
28 DEPOT ST., CONCORD, N. H.
EDITORIAL OFFICE, 126 MASSACHUSETTS AVE.
BOSTON, MASS.

Entered as Second-Class Matter at the Post Office at Concord, N. H.



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American Journal of Public Health
Official Monthly Publication of the American Public Health Association
Vol. VII DECEMBER, 1917 No. 12

ACUTE CONTAGIOUS DISEASE IN THE FRENCH ARMY.

SURGEON MAJOR E. RIST,
French Scientific Mission.

Read before the General Sessions of the American Public Health Association, October 19, 1917, at Washington, D. C.

CONCERNING the health situation in the French Army at war, there is one point which must always be kept in mind, namely, that the problems we had to deal with presented themselves under conditions entirely different from those of the British Army or of the United States Army. One must always remember the sudden onset of war on the French front, and what that sudden onset meant to us. Mobilization was ordered in France on Saturday, the 1st of August, at 4 p. m. It was to begin on Sunday, the 2d, at 1 a. m. That same Sunday Germany declared war. That same Sunday the German Army invaded Luxembourg and Belgium. On the 23d of August the battle of Mons-Charlerai was fought on the Franco-Belgian frontier. On the 3rd of September, one month after the beginning of the war, the German Army, having invaded the whole of northern France, was within 15 miles of Paris.

Mobilization, therefore, meant the gathering together, at a day's notice, of an army of about 3,000,000 men, in order to check that invasion. Out of those 3,000,000 men, less than 500,000 were in actual training, belonging to the yearly draft of young men serving for two years, under the law of conscription. The rest, more than 2½ millions, had been trained previously, but had long since returned to their peaceful, civilian occupations. Those mobilized men were not to be sent to training camps. They were to rush to the frontier at once, and to fight. There was not an hour to be lost. We could not dream of making a careful physical examination of all our men. Indeed we were hardly in a position to make any physical examination at all. Only those who reported sick were seen by the medical officers. And, believe me, there were not many, so eager were they to do their duty. Not a few concealed their ailments lest they should be prevented from going. The all important thing was to get our men together, to equip

them, and to ship them over by rail to the particular spot which had been assigned to their unit on the mobilization scheme.

From a purely military point of view, this mobilization scheme was carried out with marvellous speed and accuracy. But you will easily understand that even such important measures as antityphoid vaccination had to be postponed in face of the actual threatening invasion by the German Army. We knew very well that we were running the risk of typhoid, and, as a matter of fact, we had a severe outbreak of typhoid in our army during the winter 1914–15. So had the Germans. We knew very well that we were running the risk of other contagious diseases such as diphtheria or cerebrospinal meningitis or dysentery, and that we were probably admitting into our ranks many men infected with open tuberculosis. But, however serious this danger, it was but a trifle compared with the much more formidable and immediate danger of France being conquered.

The world knows how this danger was averted by the victory of the Marne, early in September, 1914, how trench warfare began and has not ceased yet, and how we were able to breathe again, to take up the sanitary problems in our army, and to organize the prevention of disease.

Vaccination against typhoid was made compulsory by law, and, as rapidly as could be, applied to the whole army. It was no easy task, as you well may imagine, because any interference with the immediate military necessities had of course to be avoided. Bacteriological and chemical laboratories were established in every army corps. Carriers and contacts were detected and segregated. The water supply was carefully analyzed. Every suspicious drinking water was chlorinated. Provision was made for the removal and destruction of excreta, for disinfection of clothing. In short, an efficient and modern system of prevention was at first improvised as best as we could, and, later on, completed and perfected.

I think one can easily realize what our difficulties have been. We made a bad start, and, under the circumstances, it could not but be bad. But the difficulties have been overcome to a considerable extent, and the facts and figures which I shall now give justify the opinion that the French Sanitary Service has made a pretty good record after all.

During the whole course of the war, there have been only two cases of smallpox in our army, and not more than 50 in the civilian population. I reckon from the official figures published in the *Deutsche Medizinische Wochenschrift*, that, from November, 1915, to May, 1916, more than 27,000 cases of smallpox have been registered in the civilian population of Austria alone, not including Hungary and Bosnia Herzegovine.

During the whole year 1916 bacillary dysentery has caused a severe epidemic in Germany. From December, 1915, to October, 1916, the official figures are 691 deaths in the civilian population of Prussia alone (not including Bavaria, Saxony, Wurttemberg, and the other confederate

states). The German medical weeklies do not give any figures concerning the army. But the numerous papers published by prominent German physicians, such as *His Matthes, Gottschlich, Kolle*, agree on the fact that the epidemic has been imported from the army into the civilian population, and that it was much more extended and severe in the army, the death-rate amounting to 10 and even 12 per 100. From January 1, 1915, to December 31, 1916, we have had only 193 deaths from dysentery in our army.

It is well known that typhus fever has caused many thousands of deaths in Germany and in Austria-Hungary. We have not had a single case of typhus in France, despite the fact that the disease is endemic among the native population of Morocco, whence troops have been constantly coming over to France.

Cholera has caused a severe epidemic in Turkey, where, in the short space of time—from May 14 to August 27, 1916,—13,836 cases and 7,159 deaths have been registered. Austria-Hungary has suffered from the epidemic also, and many cases have been officially recorded in Germany. The Serbian Army, during its heroic retreat through Albania, and after it had been landed in safety by French and Italian vessels on the Island of Corfou, was decimated by cholera. Although there has been a constant coming and going between French Mediterranean ports and Corfou, we have not had a single case of cholera in France.

Uncinariasis is endemic in the native population of French Indo-China. Many ten thousands of Indo-Chinese have been imported into France since the beginning of the war, to do work in the ammunition factories and in the hospitals. They have been so carefully selected, examined, and, when necessary, treated, that I don't know of any single case of uncinariasis having occurred in France.

The only tropical disease which has been imported into France so far, is amoebic dysentery. It had been overlooked at the beginning, when North African troops contaminated quite a number of men in some French units. Now the carriers are very carefully searched after, segregated and treated, and I have good reason to believe that there is no further extension of the disease.

We have had, of course, a considerable number of cases of malaria in soldiers returned from Saloniki; Macedonia, and the Vardas-Valley especially, is one of the most malaria infested places in the world. The fever is of the worst tropical type. Almost all of our cases have crescent shaped parasites in the blood. They are now all treated in special hospitals, located in such regions, where, after a careful entomological survey, it has been proved that there are no anopheline mosquitoes. No malarial hospital is allowed in a district where anophelines are present.

Now, as regards infectious communicable diseases. The monthly return of cases and deaths due to the following diseases: measles, scarlet fever, mumps, diphtheria, cerebrospinal meningitis, typhoid (including paratyphoid) and bacillary dysentery, on the front, show that there has been

a constant falling down from very high figures at the beginning of the war to remarkably low figures at the present time. During the month of January, 1915, we had 16,505 cases and 2,268 deaths from acute contagious diseases. The figures for January, 1916, are 4,692 cases and 74 deaths, and for January, 1917, 1,990 cases and 41 deaths.

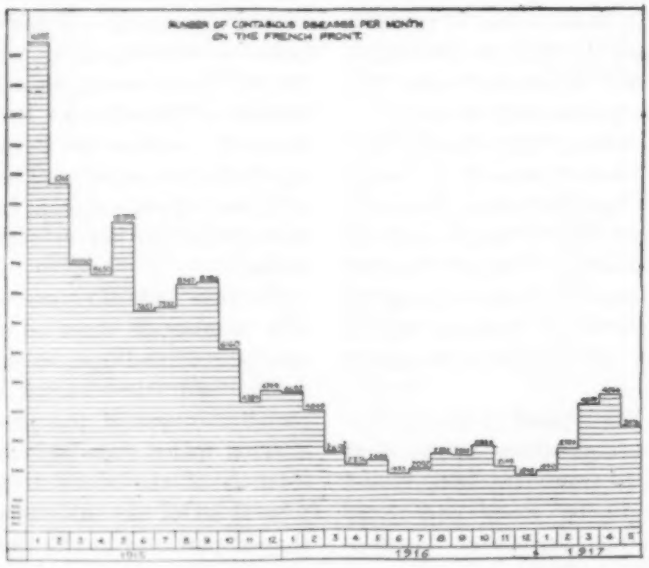

FIG. 1.

Outside the war zone, in our depots and training camps, we had from the same diseases in 1915, a sick rate of 70.05 per 1,000; a death-rate of 2.70 per 1,000; in 1916, a sick rate of 47.03 per 1,000; a death-rate of 1.05 per 1,000.

The last peace time army statistics which have been published are for the year 1911. They show us:

In 1911, a sick rate of 49.28 per 1,000; a death-rate of 0.87 per 1,000.

If we take the figures for the war zone in 1916, we get: War zone, 1916, sick rate of 12.80 per 1,000; death-rate 0.31 per 1,000.

The death and sick rates from acute contagious diseases are therefore lower on the front than they are in the interior, lower on the front than they were in peace times.

The decrease in sick and death-rate on the front from 16,505 and 2,269 in January, 1915, to 1,990 and 41 in January, 1917, is not so much due to the diminution of such diseases as measles, scarlet fever, diptheria or cerebrospinal meningitis,—notable as this was,—as to a considerable reduction of the typhoid cases. This requires some explanation. As I have said already, we were confronted, during the first winter of the war, with a very severe outbreak of typhoid. In

January, 1915, we had 13,993 cases with 2,210 deaths. The average number per month during the year 1915 was 5,587.7 cases with 493.6 deaths, a fatality-rate of 8.8 per 100. During the year 1916, the average number of cases per month was 1,040.1 with 41.7 deaths—a death-rate of 4.01 per cent. During the first five months of 1917, the average number of cases per month was 51, with 4.6 deaths—a death-rate of 8.2 per cent.

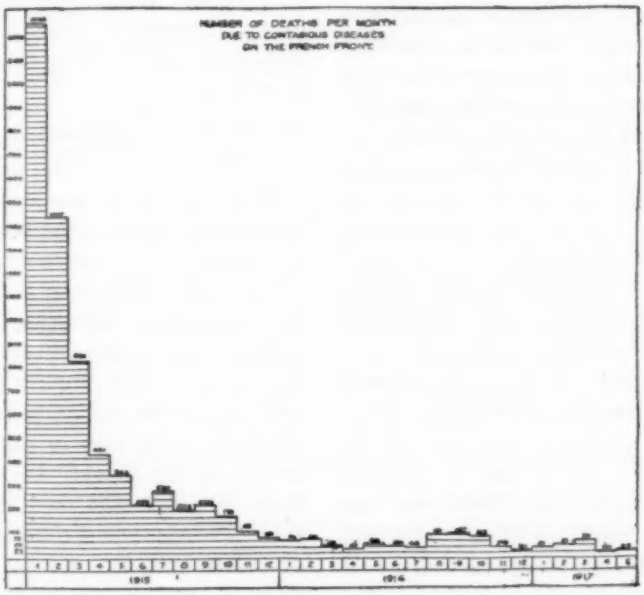

FIG. 2.

How is this to be accounted for?

When the war began, a small number of soldiers actually in training had been vaccinated against typhoid. The 2½ million men who were not in actual training when the war began had not been vaccinated. But by the end of 1915, more than 80 per cent. of our army had been vaccinated. At the same time, other prophylactic measures had been taken: the drinking water problem had been solved, the disposal of fecal matter had been provided for, the general sanitary condition of the trenches and cantonments had been much improved. Carriers had been searched for—at least in some instances—and isolated. The combined effect of those measures with vaccination was that considerable decrease of cases from 5,587.8 monthly to 1,040.1, or, to put it more strikingly, from 13,993 in January, 1915, to 323 in December, 1916.

But how can we explain the decrease of the average monthly death-rate from 8.8 per cent. in 1915 to 4.01 per cent. in 1916? The difference is

much greater still if we compare the death-rate of January, 1915, which was 15.8 per cent. with the death-rate of December, 1916, which was 2.8 per cent. It evidently cannot be due to some improvement in therapeutic methods, although there is no doubt that hospital equipment and nursing were ever so much better in 1916 than when the war began. It cannot be due solely to the fact that typhoid in a vaccinated individual runs as a rule a milder and more favorable course. As a matter of fact, my personal experience of 18 months typhoid work in a field hospital, is that, although vaccination diminishes the sick rate, it does not considerably diminish the death-rate. I even think that there is a certain type of rapidly fatal cases which is only observed in vaccinated patients and points to a certain degree of hypersensitiveness caused by previous vaccination.

The considerable decrease of the death-rate is really due to the fact that, up until July, 1916, we vaccinated against typhoid only, and that, by so doing, we caused a decrease in typhoid cases and a corresponding increase in paratyphoid cases. The abnormally high amount of paratyphoid has been observed by all the physicians on the French front who have been in a position to use blood-cultures as a routine method of diagnosis, and was considered very puzzling. A careful analytical study of all the cases which have been treated in my hospital has shown me the following facts:

Among 215 cases up to December 15, 1915, I had

56 typhoid	vaccinated	29	
	non-vaccinated	27	= 48.2%
159 paratyphoid	vaccinated	139	
	non-vaccinated	20	= 12.88%
Total 215 cases	vaccinated	168	
	non-vaccinated	47	= 21.86%

During the same period, I had, coming from the same units, from the same trenches and cantonments, 621 cases of diseases which had no connection whatsoever with typhoid or paratyphoid (pneumonia, malaria, dysentery, rheumatic fever, tuberculosis, bronchitis, etc.). They can be divided as follows:

621 non-typhoid cases	vaccinated	485	
	non-vaccinated	136	= 21.88%

It appears that, among those non-typhoid and non-paratyphoid cases, the percentage of non-vaccinated men (21.88 per cent.) was strikingly the same as among the typhoid and paratyphoid cases taken all together (21.86 per cent.). The figures 21.88 per cent. represent the percentage of non-vaccinated men in this particular section of the army. Let us suppose that we divide the men in the army into fair-haired and dark-haired men, and that we get a normal percentage of 21.88 per cent. dark haired. The color of the hair having no known connection with the susceptibility to typhoid, we must admit that, if there is an outbreak of typhoid among our men, the relative percentages of fair-haired and dark-haired will be the same among the typhoid cases than among the normal contingent. Now this is exactly what happens if we divide our men into vaccinated and non-vaccinated. And we are drawn to the conclusion that if we regard typhoid and paratyphoid as one and

the same disease, vaccination against typhoid only has resulted in leaving unimpaired the sick rate, and in substituting a case of paratyphoid for every case of typhoid it averted.

The death-rate in paratyphoid being much lower than in typhoid, it is perfectly clear that our low death-rate of 1916 was due to the abnormally high proportion of paratyphoid among our typhoid cases.

In July, 1916, we began to vaccinate our army against the three germs: B. typhoid, B. paratyphoid A and B. paratyphoid B, using what is now known as a triple vaccine. By now this triple vaccination has been almost completed. The result has been a considerable decrease of the sick rate: 51 cases per month in 1917, as against 1,040 in 1916. But the death-rate has gone up again to its previous height, rising from 4 per cent. to 3.2 per cent. The increase in death-rate is the normal consequence of triple vaccination, which has restored the usual proportions of typhoid cases as against paratyphoid cases. This augmented death-rate is much more than compensated by the lower sick rate; 51 average monthly deaths in 1917 as against 493 in 1916.

THE WORK OF THE UNITED STATES PUBLIC HEALTH SERVICE IN RELATION TO THE PRESENT WAR.

JOHN W. TRASK,

Assistant Surgeon General, United States Public Health Service, Washington, D. C.

An address delivered before the American Public Health Association, October 18, 1917, at Washington, D. C.

THE Public Health Service is protecting the health of the troops in mobilization camps and cantonments by securing the best possible sanitary conditions and health administration in the territory surrounding these camps.

It is increasing the facilities at its quarantine stations, particularly on the Atlantic seaboard, so that it will be able to meet any emergency which may arise in connection with returning troop ships with communicable diseases on board.

It has also in various ways, through its hospitals and quarantine stations and through the assignment of some of its officers to the army and navy, been able to be of service to the war and navy departments.

With regard to the work in the extra cantonment zones, in the vicinity of the army cantonments the population is in an unsettled condition. First there came to these areas thousands of workmen to erect the buildings. Later, with the advent of the troops, there have been coming other thousands, camp followers in a way, those who will engage in various kinds of business and cater to the needs and entertainment of the soldiers. The cities are increasing temporarily in population, towns are doubling and

trebling in size, and new towns are coming into existence, almost overnight. The soldiers will mingle with the civilian populations in these areas, and the health hazards of the one will be and are the health hazards of the other.

Disease tends to spread, and health hazards consequently to increase, wherever people are brought together in large numbers. The greater the number of people, the greater the number of persons among them carrying the infection of communicable diseases. The greater the number of people brought together in a given area, the greater are the chances for infected persons to infect others and for disease to spread. This is particularly so where large numbers are brought together suddenly, where towns spring up, or where the populations of existing towns are greatly increased. In cities and population groups of gradual growth, measures of protection against health hazards are usually developed with the growth and needs of the population, but where there is a sudden and proportionally great increase there is brought together a population for which there is no adequate provision against the spread of disease. The principal agencies by which communicable diseases are spread are contact with infected persons, the use of infected milk and other food products, infected drinking water, and flies and mosquitoes. These agencies, uncontrolled or inadequately controlled, constitute health hazards which become an acute menace with the unsettled conditions accompanying a sudden increase in the number of people in a community.

From the standpoint of the federal government the troops must be protected from all unnecessary hazards, including the hazards of preventable disease, that their full and unimpaired strength may be preserved for their real work and because it is not intended that they shall be exposed to hazards that are useless and avoidable.

At the same time the sanitary and health hazard conditions being created in the civil areas surrounding mobilization camps are the necessary result of the country's present undertaking. They are not conditions for which the localities in which they occur are responsible. The communities in the extra cantonment zones compare favorably in their sanitary condition and provisions for the control of disease with similar communities elsewhere. The underlying facts are that the provisions for the control of disease in most communities are far from complete even under usual and normal conditions and that sudden increases in population in small cities and towns, such as are occurring in these areas, create acute problems.

In view of the necessities and responsibilities of the government, it has become the work of the United States Public Health Service to see that the sanitary conditions in the civil zones around mobilization camps are such as not to be a menace to the troops and that the provisions for the control of disease in these zones are adequate.

At first it looked as though the sit-

uation might offer peculiar difficulties. The obligation to protect the troops rested upon the federal government while the police powers in the civil zones around the military camps rested with the state authorities. The matter was quickly solved, however, in most instances by the state authorities who gave the Public Health Service officers technical appointments under the state and thus conferred upon them the civil police powers. This is but one of the many illustrations of the promptness with which the state health authorities have universally shown their eagerness to cooperate and to do whatever was possible to assist in the work.

On the part of the federal government, no special act of Congress was required to make the work possible, inasmuch as existing statutes provided amply for the prevention of the spread of disease from one state to another and for coöperation between the Public Health Service and state and local health authorities.

As soon as the locations of the cantonments for the national army and of the camps for the national guard had been decided upon, parties were started out to make sanitary surveys of the civil areas around the proposed camp sites. The first parties were sent out as early as last June. Their purpose was to ascertain as regards these areas the provisions for and the actual efficiency of local health administration, the condition of existing water supplies, with special reference to their purity or pollution, or possibility of pollution, the condition of the local milk supplies, the prevalence of communicable diseases and the extent to which the spread of these diseases was being prevented. Particular attention was given to the presence or absence of malaria and of conditions favoring the breeding of anopheline mosquitoes which spread the disease. After completing each survey a report was made of the measures necessary to remedy existing defects and to provide adequately for sanitary administration and the prevention and control of communicable diseases.

So far, officers of the Public Health Service have been placed in charge of sanitation and health administration in the civil zones around 20 mobilization camps. In most instances these officers, in addition to having been made officials of the respective state departments of health, have been vested with such powers as the local city and county authorities concerned can give. Thus these officers possess the unusual advantage of the combined authority of the federal government, the state government, and the local government.

Much of the work done in each civil zone will be of permanent benefit to the locality. In mobilizing the resources available for the work in each zone, therefore, consideration has been given, first to the existing resources of the various local governments, that is, city and county governments, and to the additional funds they are able to make available. Secondly, cognizance has been taken of the assistance which the state health departments could give. Then the Public Health Service has assumed, where necessary, much

of the burden of sanitation in the rural territory outside of cities and of the measures necessary for malaria control and the elimination of mosquito breeding places. Finally, the Red Cross, through its recently created Bureau of Sanitary Service, renders most valuable aid by supplying, where needed, what are known as Red Cross Sanitary Units. These units consist of bacteriologists, sanitary inspectors, public health nurses, clerks, laboratory assistants, and miscellaneous employees. These units, by supplying a working personnel, have been an important factor in making it possible to get the work started in the various zones without delay. Through the mobilization and coördination, under an officer of the Public Health Service, of the authority and resources of the communities concerned and of the state and federal governments, supplemented by the assistance of the Red Cross, where needed, effective and coördinated sanitary control has been made possible.

In determining the civil areas which will be taken under sanitary control an effort is made to include all the territory which will be frequented to any considerable extent by the troops from the cantonment or camp. In most instances the zone is at least five miles wide, and, in addition, includes all cities connected with the camp by railroads or other transportation facilities in such a way that the soldiers will naturally be frequent visitors. In some instances the zone includes all of a county, in other instances as much as two counties, or parts of several counties. The zone, for instance, around Fort Oglethorpe, Ga., includes parts of Hamilton County, Tenn., Walker County, Ga., and Catoosa County, Ga. Included in this area, involving parts of two states and three counties, are nine municipalities, including the city of Chattanooga. The population of this civil area is approximately 100,000 at the present time.

During the preliminary survey of these extra cantonment areas the nature of the local health laws and regulations was studied. One of the first steps taken by the officer of the Public Health Service upon assuming charge of the sanitary administration has been to have adopted whatever additional health regulations and ordinances were necessary for proper sanitary control. In most instances it has been necessary to have adopted ordinances and regulations regarding such matters as the maintenance of surface wells, ordinances requiring property owners to connect with public sewers and water mains, and ordinances and regulations relating to the production, handling, care and sale of milk and other food products. When these ordinances are adopted, it becomes the duty of the Public Health Service officer and his staff to enforce them, as well as the requirements for the reporting of cases of communicable diseases and other existing laws and regulations relating to the public health. The enforcement is really the keynote to the situation. No matter how many laws a locality may have for the protection of the public health and no matter how wisely and carefully these laws may have been

drawn, the laws cannot enforce themselves, nor in any way improve sanitary conditions. It is the degree and manner of enforcement that counts, and little law thoroughly enforced will accomplish far more than much law unenforced.

The personnel of the local health departments is used as the nucleus of the sanitary staff, to which are added epidemiologists, sanitary engineers, bacteriologists, medical inspectors, public health nurses, sanitary inspectors, and such other employees as may be necessary. The state health department in many instances gives the service of one or more of its experts. The Public Health Service puts in trained men, chiefly for administrative supervision, and, finally, the Red Cross fills in the gaps in the needed personnel through its sanitary unit organization. Thus is built up the organization for the enforcement of the health laws and regulations which have been previously adopted.

The purpose of the work being carried on in these extra cantonment zones is the prevention of the spread of communicable diseases both among the civil population and from the civil population to the troops. The first essential in the control of communicable diseases is prompt information of when and where cases are occurring in the community. One of the first things undertaken by the officers in charge of zones, therefore, has been the establishment of relations with the practicing physicians whereby they will report promptly all their cases of communicable diseases. It is explained to them that if they fail to report their cases they are preventing the proper protection of the health of the troops. The health department with regard to each reported case takes such precautions as are indicated to prevent the further spread of the disease. The home of the patient is visited. Where possible, the source from which the sick contracted the disease is ascertained. The members of the household in which the case occurs are instructed regarding the manner in which the disease is spread and what precautions should be taken. The household is placed under supervision or a limited quarantine, or, if necessary, an absolute quarantine. If the disease is smallpox, or typhoid fever, diphtheria, or other disease immunity to which can be obtained by preventive inoculation of vaccines or antitoxins, such inoculation is given to the members of the household or persons exposed to the case.

In the small towns and strictly rural territory, the plan is to make a sanitary inspection of every home, paying particular attention to the water supply, the method of sewage disposal, and the presence of cases of communicable diseases in the household and to make inquiry regarding cases of sickness which have occurred in the recent past. This is also being done in some of the cities.

As regards malaria prevention, it is the intention to prevent the breeding of the anopheline mosquitoes in an area a mile wide immediately surrounding the mobilization camps. As the anopheline mosquitoes seldom, if ever, travel more than a mile, this will give protection to the troops within the

camp. All practicable measures for the control of malaria will also be carried on throughout the entire civil zone to prevent the soldiers from becoming infected with malaria while away from the camp. The measures which are being employed and which will be carried on with increased vigor during the next malaria season—that is, next spring—are the draining, where practicable, of all swampy areas and accumulations of water in which anopheline mosquitoes can breed, the channeling of streams so that the water will flow quickly along its course, the oiling of such places as cannot be filled in or drained, the screening of houses, and the supervision and treatment of cases of malaria, including the prophylactic use of quinine by persons exposed to the disease.

The conditions under which milk is produced, handled and sold are being carefully regulated, and, where possible, pasteurization is being required.

Special attention is being given to the prevention of the fly nuisance, particularly in municipalities, where their breeding will be kept under control through the proper disposal of stable refuse and other accumulations in which flies lay their eggs and the larvæ develop.

The public water supplies of municipalities are being kept under expert supervision. Water mains are being extended wherever practicable, so that the greatest possible proportion of households may use the public supply. Hundreds of contaminated wells have been filled in to prevent their use.

School children are being kept under medical supervision for the early detection of cases of communicable diseases.

Free vaccination against smallpox is being offered to children and adults alike, also free vaccination against typhoid fever and paratyphoid fever. In some of the zones thousands of persons have already availed themselves of both the smallpox vaccination and the prophylactic inoculation against typhoid fever.

An important part of the work is that being done by the public health nurses. These most valuable adjuncts of the health department will keep under supervision cases of communicable disease, giving particularly close supervision to those cases in poor households where precautions against spread would ordinarily be at a minimum. They will keep under observation quarantined households, collect specimens for laboratory examination and be useful in a thousand and one other ways.

Active publicity and educational campaigns are carried on in all the zones, the purpose being to keep the people thoroughly informed as to just what the health administration is attempting to accomplish and why. Series of lectures are given at schools and at public meetings, and bulletins are distributed to the homes.

With regard to other work of the service incident to the war, as referred to in the beginning, the facilities of certain of the quarantine stations along the Atlantic seaboard are being greatly increased. Additional barracks are being built, hospital facilities en-

larged, additional floating equipment and vessels for disinfection and fumigation secured, and all the necessary accessories incident to such work are being augmented. Should returning troop ships arrive in an infected condition, with dangerous communicable diseases on board, the troops and crew can be taken off and cared for at these stations and the vessels disinfected and returned to use with a minimum of delay. It is hoped that there will be little need for these quarantine stations because of infection among the troops. Experience, however, would indicate that there will be considerable use for them.

The facilities of certain of the other quarantine stations, both on the Atlantic and Pacific coasts, have been useful in various ways to both the War and Navy Departments. The twenty-three hospitals of the service, located in various ports, will probably be of increasing service as the war progresses.

Before the war the Coast Guard, formerly the Revenue Cutter Service, was under the Treasury Department and the medical officers of the Public Health Service furnished medical and surgical relief to the officers and enlisted men and in effect constituted its medical service. With the declaration of war, the Coast Guard became a part of the navy. With the Coast Guard vessels went the officers of the Public Health Service who were on them at the time, sixteen in number. The service is continuing to furnish on land medical and surgical relief to the Coast Guard, for whom it also makes physical examinations of applicants for commission and enlistment.

If the war is prolonged the Public Health Service will have much other work to do. What it is now doing must necessarily be considered but the beginning. The present war in many ways is one of nations rather than of armies. The human toll of the war will be for our country, as it is for other countries, not a matter merely of the numbers killed and wounded in battle but as truly a question of the numbers that will succumb because of the changes in civil life incident to the war. These changes are brought about by the increased amount of work to be done, longer hours of labor, the employment of women and children, the congestion of population in industrial centers. The increased cost of living will be a factor as will numerous other conditions incident to the equipping and maintaining of large armies in the field. All these things mean more physical disability and sickness. They mean increased health hazards and increased death-rates among the civil population. It is not improbable that the war toll of lives among the civil population may be numerically as great as that of the army. The nations which have been at war for some time have come to realize fully this fact.

If ever there was need for efficient health administration and sanitary control it will be during the present war. Certain of the allies found they had made the mistake during the mobilization of their armies of sending skilled mechanics to the trenches. They returned them to the munition plants. There is the danger that a considerable proportion of our all too

few trained health officers will leave their work to join the fighting forces without having trained others to do their work in city and state health departments. That the nation may wage war with the greatest possible effectiveness there will be a pressing need for more extensive and efficient health supervision by state and municipal governments. There will be need of increasing the number of people engaged at this work by recruitment where possible from those not available for military duty or for work in the strictly war industries.

The federal, state and municipal health services have a work to perform which will demand their closest cooperation and will tax their resources to the utmost.

RESULTS OF STUDIES ON EPIDEMIC POLIOMYELITIS.

E. C. Rosenow,

Mayo Foundation, Rochester, Minnesota.

Presented before the Laboratory Section of the American Public Health Association, Washington, D. C., October 20, 1917.

I ACCEPTED the invitation to present before the American Public Health Association the results of my studies on poliomyelitis with some hesitation, since the details of much of the work have not yet been published. However, I consented to do so in the belief that it might lead to a better and a wider understanding of the disease in its various manifestations.

Ever since Landsteiner and Levaditi and Flexner and Lewis demonstrated the virus of poliomyelitis to be filtrable, bacteria of ordinary size growing on ordinary media under aerobic conditions have been considered of little or no etiologic importance in this disease. My own studies were undertaken to determine, by methods used in other diseases, whether there is present in the infection atrium (tonsils, throat, adenoids, etc.) and in the involved tissues themselves, bacteria of the above type which might localize electively in the central nervous system of animals.

From July 21 to August 10, 1916, there were studied seven typical cases of epidemic poliomyelitis which occurred in Rochester. The cultures obtained from material expressed from the tonsils, injected intravenously in young animals (chiefly guinea-pigs and rabbits) was followed by flaccid paralysis in some of the animals in each case. On the basis of these striking results I decided to go to New York where these experiments might be repeated and where post-mortem material might be available. From August 12 to October 6, during the height of the epidemic in New York, in conjunction with Dr. E. B. Towne and Dr. G. W. Wheeler, the above results were verified with tonsil strains and extended to strains from brain and

cord. At a later date, by the use of similar methods, similar results were obtained with brain and cord strains by Mathers, and Nuzum and Herzog. The extirpated tonsils of patients who were not convalescing as they should be and particularly those obtained in fatal cases, were found to contain peculiar abscesses in which this streptococcus was present in enormous numbers. Cultures of the brain and cord in each of twelve fatal cases yielded the identical streptococcus which also showed a marked tendency to invade the central nervous system of animals. The same organism has been isolated from the brain and cord of every monkey paralyzed either with fresh human virus, with glycerinated human virus, glycerinated monkey virus or with filtrates of virus. Moreover, it has been repeatedly isolated from glycerinated human and monkey virus months after glycerination and from filtrates of virus which were proved to produce poliomyelitis in monkeys.

Control cultures in numerous normal guinea-pigs and rabbits, and in inoculated monkeys dying of ulcerative colitis, showed streptococci in small numbers in a few instances only, and these were either culturally or immunologically different from those isolated from poliomyelitic tissues. On blood-agar plates the organism produces fine, dry, non-adherent, slightly green colonies, at times showing in forty-eight hours a narrow hazy zone of hemolysis. On this medium, as well as in ascites-dextrose agar, the organisms are quite uniform in size and resemble pneumococci, but are usually smaller and free from demonstrable capsule. In tall tubes of ascites-dextrose broth with or without sterile tissue there is usually an early diffuse turbidity, or there may be a flocculent growth which collects along the side of the tube and gradually settles to the bottom. Early smears show short chains of diplococci resembling pneumococci, a smaller number of medium-sized cocci in pairs, and occasionally very small coccus forms. In ascites fluid containing sterile tissue the growth appears as a slight haziness near the bottom of the tube on the fourth or fifth day when cultures are made of human or animal brain and cord. In a very few instances the early smears have shown the tiny globoid bodies described by Flexner and Noguchi in apparently pure culture, but usually there have also been a certain number of medium-sized diplococci in short chains, which Flexner and Noguchi and others have considered contaminations. Transplants from one to another of these liquid mediums disclose a marked tendency of the microörganism to change to the form characteristic of the medium in which it is planted. Thus, an apparently pure culture of the very small globoid bodies in ascites tissue fluid when transferred to ascites-dextrose tissue broth grows out rapidly, often in twenty-four hours, into the characteristic polymorphous streptococcus. Similarly a transplant from broth to ascites fluid tends to grow slowly smaller.

The mechanism by which the large forms become small has been demonstrated. Cultures of Berkefeld N

filtrates of emulsions of brain and cord of rabbits dead from paralysis following intravenous injection, with suspensions of broth cultures showing only the large forms, have repeatedly grown out in this characteristic form in each of these culture mediums. Cultures showing the small forms have been filtered, and cultures of the filtrate have grown, but no growth has been obtained from filtrates of cultures of the same strains showing only large forms. The same emulsions filtered through dense porcelain candles have, with few exceptions, always been sterile.

In all the liquid mediums during the early days of growth, chains are often found in which there are single members of all sizes and shapes—large diplococci, large coccus forms, small diplococci and small coccus forms. Frequently, elongated forms resembling diphtheroid bacilli or distinct rods are found in chains which are made up chiefly of typical diplococcus forms. This has occurred in strains that have been fished successively several times from single colonies of shake and plate cultures, and in those from filtrates, and are therefore believed to be variations of one organism and not contaminations.

The importance of immunologic studies with this pleomorphic streptococcus to determine the exact relation between this organism and virus as generally understood, was recognized very early in the work. Recently isolated cultures were found to protect monkeys against virus (9). Horses have been immunized, one with cultures isolated a short time previously from brain and cord of monkeys paralyzed with virus, and another with those isolated from the cases of human poliomyelitis which occurred last summer (6). By means of these sera it has been determined that the strains isolated from human poliomyelitis and experimental poliomyelitis in the monkey (following injection of virus) are immunologically identical, both being cross-agglutinated specifically in high dilution by these sera respectively. Moreover, by selecting particularly sensitive strains with the immune horse sera, it has been found that the serum of patients and monkeys having recovered from poliomyelitic attacks likewise agglutinated specifically the strains both from human and monkey poliomyelitis. The serum from the horse (Horse 1) injected from Nov. 2, 1916, to May 10, 1917, with recently isolated strains from monkeys was found to have definite protection and apparently curative power against virus in monkeys.

The effect of this serum was tested recently on 56 cases of human poliomyelitis during the epidemic at Davenport, Iowa. The technic of the preparation and administration of the serum, the diagnostic tests and the results obtained in 44 cases have already been published. The details of the cases will appear later (7). Suffice it to state that all the 16 patients who received the serum before paralysis had set in recovered promptly without paralysis. All the 17 patients with slight paralysis who received the serum likewise recovered. In only one of these did the paralysis extend, and

then only slightly. In all the others paralysis was arrested and recovery took place promptly. All will undoubtedly have complete restoration of function. Twenty-three patients had advanced paralysis when serum treatment was begun. Ten of these died, giving a mortality rate of 18 per cent. Seven were practically moribund when the serum was given, and hence cannot be counted against the serum. In the 3 remaining fatal cases the serum had time to act. One was a baby 11 months old, semicomatose with spasms eight days after the onset of the illness when the serum was first given. One, a boy 2 years old with cyanosis, marked tremors, high fever, severe gastro-enteritis and beginning respiratory paralysis on the second day at the time of the first injection; and one, a girl 11 years old, with high fever and paralysis of the face on the third day when the first dose of serum was given. Hence this makes a mortality of about 6 per cent. in sharp contrast to the 9 deaths which occurred in 23 untreated cases; a mortality rate of 35 per cent.

The epidemic in Davenport differed from those studied last year in Rochester and in New York in that gastro-intestinal symptoms and the symptoms referrable to the central nervous axis were more pronounced, and that the mortality rate was higher in the cases in which serum treatment was not used. The results obtained last year with reference to the tonsils as affording an important place of entrance for the infection, have been verified and extended. Glandular enlargement was found in many cases to be in proportion to the evidence of infection in one or both tonsils, as obtained on examination of the patient and on dissection of the tonsils after death.

The identical streptococcus has been found in enormous numbers in the characteristic abscesses in tonsils. It has been isolated from brain and cord in all fatal cases in which cultures were made, and from monkeys paralyzed with the new virus. As occurred last year, injection of recently isolated cultures into animals was followed by characteristic localization. Very little or no evidence of contact-infections could be found. The occurrence of more than one case in a family was rare and in such instances the attacks were close together. A careful study of the state of health of others in the family in which typical cases occurred, and of the general health of the community at the time of the epidemic, the details of which will appear subsequently, brings with it the conviction that a large proportion of the population harbored the infection and that only one case out of the usual number (1 in 600 to 1 in 1,000 inhabitants) developed the typical symptom complex recognized as poliomyelitis. From the studies detailed here the infection appears to be due to a form of streptococcus (using this term in the broad sense) having peculiar localizing powers. In this connection it is of interest to note that the incidence of poliomyelitis in families and the community at large during epidemics in summer, is about that of rheumatic fever or pneumonia during the colder seasons when the more viru-

THE EVOLUTION OF COUNTY HEALTH WORK.

Secretary North Carolina State Board of Health, Raleigh, N. C.

Read before the Public Health Administration Section, October 17, 1917, at Washington, D. C.

UNDER this heading I wish to direct your attention to three phases of the county health problem, to wit: (1) The field of county health work, (2) the nature of county health work, and (3) the natural growth of county health work.

The Field of County Health Work.

A permanent and adequate field of county health work rests upon due observance of two important principles of our government. The first of these principles is that which provides unrestricted opportunity, and the second principle is that which recognizes the wisdom of limited assistance.

The principle of unrestricted opportunity is provided through the division of the central government into a descending series of smaller governments. This arrangement permits the smaller division to move forward without waiting for mass movement, naturally clumsy and slow. A state without waiting for national prohibition may adopt state prohibition. A county without waiting for state prohibition may have local option. Just so in the field of human conser-

vation. A state or a county need not wait on the national government to move. Moreover, if the national government moves, and moves as far as it can, there will remain a large field for state health work. And again, if the state government moves, and moves as far as it can, there will remain large opportunities, with correspondingly heavy responsibilities, for the county, as indeed, will still be the case with the individual when nation, state, and county have exhausted their resources for human conservation.

The second principle of a wise limitation of assistance makes it necessary that the county shall occupy its own field of health work. For a parent to do for a child, or for a parental government to do for the smaller constituent unit of government that which it should do for itself is to cause loss of interest, apathy, atrophy, dwarfism, paralysis, death. Trial, experience, self-reliance are as essential to symmetrical development as food. Parents and parental governments should point out duties, encourage utilization of opportunities, and assist the child but not do for it those things that it should do for itself. There is a field of county health work, a field of health work which only the county can rightfully occupy.

The Nature of County Health Work.

The nature of anything is best appreciated when approached through the analytical process. Problems of social physiology and social pathology are most clearly understood when broken down into their elemental parts. The county health problem is best appreciated when resolved into its elements, into units of county health work. The unit conception of county health work is represented graphically and simply in the following figure:

COUNTY HEALTH WORK

Control of Contagion
Inspection of Schools
Soil Pollution Work
Life Extension Work
Infant Hygiene Work
Abatement of Nuisances
Anti-Malarial Work
Anti-Tuberculosis Work

This diagram shows the units from above downward in the order in which we in North Carolina attack them. The variations in space allotted to the different units indicate our estimate of their relative costs. The number of units is not essential. Sanitarians of equal standing will subtract or add to our simple diagram. The order in which the units are placed is not essential. Sanitarians of equal standing will arrange the units in different orders. The relative cost of the units, as indicated in the diagram, is not essential. Sanitarians of equal standing will re-arrange the budget. The detailed plan for dealing with any

lent streptococcal respiratory and tonsillar infections occur in epidemic form.

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THE EVOLUTION OF COUNTY HEALTH WORK.

W. S. RANKIN, M. D.,

Secretary, North Carolina State Board of Health, Raleigh, N. C.

Read before the Public Health Administration Section, October 17, 1917, at Washington, D. C.

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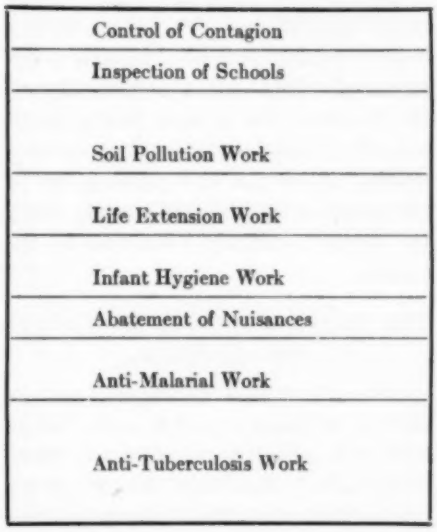
COUNTY HEALTH WORK



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particular unit is not essential. Sanitarians of equal standing will have different and equally effective plans for handling the same unit. The one and only essential in this conception of the nature of the county health problem is its unit structure.

The unit conception of county health work enables us (1) to attack the county health problem through a detailed plan and with a definite object, (2) to attack the county health problem effectively either in part or as a whole, (3) to cut the garment to fit the cloth, or to plan our county work to fit the available resources of the county.

The Natural Growth of County Health Work.

The aforestated conception of the nature of county health work would lead us to expect its natural growth to be by units. Moreover, the past development of county health work and the present direction of its growth indicate the first stage as—

The Optional Unit of County Health Work.

This first stage in the growth of county health work has been going on, rather vigorously, I think, we might say, since 1911. During the last six years nearly all the counties of the South have made appropriations to be expended on a unit of work directed, first, against hookworm disease, and later, the larger phase of that problem, soil pollution. Counties in the South have probably expended something like $1,000,000 on this unit. Counties in one state have expended $13,000 in the last two years on a unit of typhoid vaccination (not shown in the diagram) and in this way have vaccinated 128,000 people at an average cost to the county of approximately ten cents a vaccination. Another unit that has been successfully carried out is a medical inspection of schools unit. A unit of county control of contagions has been tried successfully. A unit of life extension work, similar to the work of the Life Extension Institute in New York for the employees of large corporations, is being attempted, and so far with encouraging results.

In the development of county health work on the optional unit basis, the state health authorities proceed as follows: First, an entity or unit of county health work is selected, a plan for dealing with the unit, complete in every detail, including necessary literature, illustrated lectures, press articles, forms, necessary time to finish, force of workers needed, and budget is prepared. Second, the state authorities then propose to a county that for a definite appropriation, usually 75 or 80 per cent. of the actual cost of the unit, amounting to from $200 to $2,000, they will carry into effect the plan of work as submitted. Third, the state authorities are responsible to the county and the work is therefore supervised by the state and carried out by employees of the state.

The Prescribed Unit of County Health Work.

The General Assembly of a state in which the counties had been using

two optional units of county health work recently made the optional units prescribed units for all the counties. The work prescribed for the county is carefully detailed and the county is required to pay a definite sum on certification from the state officers that the local official has satisfactorily performed his duties. This legislative transformation of the optional into a prescribed unit of health work appears to be the most natural course the development of county health work could take and will take.

The County Health Department.

The county health department will be the third and last stage in the development of county health work. This stage of growth will be reached when the prescribed plus the optional units of work, for which the county has become responsible, require a permanent force of workers and necessitate an annual budget amounting to at least $3,500. A county department of health developed as an outgrowth of the unit plan of work would naturally possess the carefully detailed plans, the definiteness of object and the well thought out budget of the unit principle.

The county department of health should not be confused with the whole time county health officer idea. There are two important differences: First, in the whole time county health officer idea the dominant thought is an official; in the county health department idea the dominant thought is a plan of work. The whole time county health officer idea does not necessarily, and, as a matter of fact, does not nine times in ten, include a plan of procedure. The county health department idea starts out with a comprehensive and detailed plan of work which includes, as an essential part, a properly qualified and paid health officer. Second, the whole time county health officer receives from six to seven dollars a day for his services and devotes from 35 to 60 per cent. of his time to work that can just as well be carried on by clerical help that can be obtained for from two to three dollars a day. The county health department plan prevents waste of this kind by providing adequate clerical assistance.

Accelerating Natural Growth.

There are two ways of accelerating growth: fertilization and cultivation.

The fertilizer for county health work is a county subsidy. To illustrate the application: In a certain state there are in process of establishment ten county health departments. Five of the ten are manned and in operation. These departments are planned on the unit basis and are maintained on an annual budget of $6,000 a year. Of this amount, 50 per cent. during the first year is contributed jointly by the State Board of Health and the International Health Board; 40 per cent. during the second year is contributed by these assisting agencies; and 25 per cent. during the third year. During the fourth year, and after, the county pays the entire cost. The plan has become sufficiently well rooted to withstand both the cold of public indifference and the heat of political friction. The county subsidy

is the fertilizer for county health work —for county health work in any of its three stages of growth.

But cultivation is even more necessary for growth than fertilization. This applies to the growth of the seed of conduct, ideas, as well as to the growth of the seed of vegetation; and it applies to the growth of the seed in that higher transformation of dust that we call brain as well as to the growth of the seed in the dust that we call soil. The place of the subsoiler, the plow, the harrow, the cultivator, the hoe, in the cultivation of the seed of vegetation must be taken in the cultivation of the seed of sanitary conduct by the health bulletin, pamphlets and leaflets on preventable diseases, health exhibits, health press service, and health lectures.

"Behold a sower went forth to sow." Some seed fell by the wayside, some in stony places, some among thorns. Others in good ground. The hard places by the wayside, the hard-headed indifference and conservatism of the backward-looking people must be broken up, agitated, softened, for the reception of new ideas. The shallow soil of stony places, the effervescent enthusiast who gets religion quickly, who promises all and produces nothing, must be made to think deeper. The thorns, the antivivisectionist, the antivaccinationist, and other faddists—noxious plants—must be dug up and not allowed to take away the nourishment from useful plants. The good ground that produces sixty-fold must be agitated and cultivated until it produces a hundred-fold.

To conclude: The rate of growth of county health work will depend on (1) the way you fertilize or subsidize it, (2) the way you cultivate sanitary ideas, the way you till the soil of public thought.

Editorial Section

AMERICAN JOURNAL OF PUBLIC HEALTH
EDITORIAL OFFICE: 126 MASSACHUSETTS AVE., BOSTON, MASS.
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THE LOCAL HEALTH OFFICER IN NATIONAL DEFENSE.

One of the most conspicuous features of the recent Washington meetings of the Association was the emphasis laid upon the necessity for coöperation in war work on the part of the local health officer.

In introducing Mr. Hoover the chairman intimated that there were 15,000 officials in the United States, who could be of material service to the Food Administration. Mr. Hoover's response was an appeal to the profession for aid in educating the public regarding the problem of food conservation.

Again, the health officer is asked to assist in providing healthful conditions in zones surrounding cantonments suppressing venereal disease, and by guarding the health of munitions workers. In some instances he has manufactured sera and vaccines for military use.

Finally we have the health of the civil population to consider. We hope to have several million men on the battlefields of France. It will require a healthy civilian nation to keep them supplied with the means of warfare. Consider, for a moment, the disastrous effect of a typhoid epidemic in a city preparing munitions, clothing, or food for our armies. The need for saving the babies is now even more important than before the war.

Health appropriations should be increased, not diminished. But especially let the local health officer earnestly study the health problems created by the war and devise means to meet them.

VENEREAL DISEASE SYMPOSIUM TO APPEAR IN "SOCIAL HYGIENE."

At the request of Major W. F. Snow, President of the American Social Hygiene Association, the papers comprising the venereal disease symposium delivered at the Washington meeting of the Public Health Administration Section on October

18, will be published in the January number of *Social Hygiene*, the official organ of the American Social Hygiene Association. The meeting in question was a joint meeting between the two organizations.

The papers involved are those of Colonel Russell, Surgeon Holcomb, Mr. Fosdick, Assistant Surgeon-General Kerr, and Assistant Surgeon-General Frost.

A free copy of *Social Hygiene* will automatically be mailed to all members of the American Public Health Association by the publishers, whose address is 105 W. 40th St., New York City.

TWO NEW NOTE SECTIONS FOR THE JOURNAL.

Beginning with this issue, the JOURNAL will have each month two note sections entitled "Public Health Laboratory Notes" and "Association News," respectively.

The "Laboratory Notes" are intended primarily for the man who is unable to follow the literature closely, but still wishes to remain informed of progress. The "Notes" are not intended to supplant the class periodicals devoted to chemistry, bacteriology and pathology, but more to supplement and call attention to them, while at the same time giving such specific information which no sanitarian can afford to miss.

As the name implies, this section will deal only with reviews of a public health nature.

The preparation of abstracts will be in the hands of Dr. Arthur Lederer, Director of the West Virginia State Hygienic Laboratory. Experience and training have given Doctor Lederer excellent qualifications along these lines, and we may look to him for an interesting and valuable note section.

The "Association News" will serve to remind us that the Association is doing its work throughout the year, and not at annual meetings alone. News will be given out regarding the work of the central office, the executive committee, and special committees; and it is requested that section officers send each month such items as would be of general interest to the Association members.

THE PERIOD AFTER "PER CENT."

In common with other scientific publications, the JOURNAL has in the past used the dot after "per cent." The expression is an abbreviation of the Latin *per centum*, hence the custom.

There are at present a number of objections to the practice, however: first, it causes needless inconvenience; second, the period may be mistaken as indicating the end of a sentence instead of an abbreviation; third, it produces a hybrid expression. "Per cent." should be either Latin or English. That it is not Latin is indicated by the absence of italics, which even purists omit. Then, if English, why hang on to the period, which refers it back to *per centum!*

Ergo, vanish the dot after January 1, 1918.

Contributors to the JOURNAL are asked to take notice. We hope that the editors of other scientific journals will take the question under advisement.

THE DETERMINATION OF ICE CREAM AS A FACTOR IN THE SPREAD OF TYPHOID FEVER INFECTION.

L. L. LUMSDEN,

Surgeon, United States Public Health Service, Washington, D. C.

Read before the Public Health Administration Section at Washington, D. C., October 17, 1917.

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The outbreak in Birmingham occurred in the period June 9 to July 15, and comprised about 350 cases in excess of the average number for the corresponding period of the several previous years. The outbreak in Chattanooga occurred in the period July 15 to August 15, and comprised about 75 cases in excess of the average number for the corresponding period of the several previous years.

The excessive case incidence in Birmingham was 1 to about 428 of population, and in Chattanooga 1 to about 666 of population. In each outbreak the excess of cases over the usual corresponded approximately to the excessive number of cases giving a definite history of exposure to the implicated ice cream supply.

EPIDEMIOLOGICAL FEATURES.

The findings in each of these two outbreaks are regarded as fairly representative of the epidemiological features which may be expected generally to be found in extensive urban outbreaks of typhoid fever caused by ice cream borne infection.

Distribution. The disease spread generally throughout the city and fell especially upon the better residential sections. The case incidence was higher among those living under the best sanitary conditions than among those living under the poorest sanitary conditions. Children between five and fifteen years of age living under good economic conditions furnished a strikingly large proportion (about 30 per cent.) of the cases. At several places outside the city at which, during the period of causation of the outbreak, some of the suspected ice cream supply was distributed, groups of cases among users of the ice cream developed synchronously with the cases constituting the outbreak in the city. The distribution of the outbreak corresponded roughly to the distribution of the implicated ice cream supply.

Character. Each of the outbreaks was somewhat explosive in character. The periods of causation appeared to be about one month in duration. In each instance, however, between 30 and 40 per cent. of the cases developed within a period of seven days, suggesting that the outbreak may have been caused in large part by infection distributed in one day. The cases generally appeared in duration of attack, in severity of symptoms and in fatality to strike a medium between the aver-

18, will be published in the January number of *Social Hygiene*, the official organ of the American Social Hygiene Association. The meeting in question was a joint meeting between the two organizations.

The papers involved are those of Colonel Russell, Surgeon Holcomb, Mr. Fosdick, Assistant Surgeon-General Kerr, and Assistant Surgeon-General Frost.

A free copy of *Social Hygiene* will automatically be mailed to all members of the American Public Health Association by the publishers, whose address is 105 W. 40th St., New York City.

TWO NEW NOTE SECTIONS FOR THE JOURNAL.

Beginning with this issue, the JOURNAL will have each month two note sections entitled "Public Health Laboratory Notes" and "Association News," respectively.

The "Laboratory Notes" are intended primarily for the man who is unable to follow the literature closely, but still wishes to remain informed of progress. The "Notes" are not intended to supplant the class periodicals devoted to chemistry, bacteriology and pathology, but more to supplement and call attention to them, while at the same time giving such specific information which no sanitarian can afford to miss.

As the name implies, this section will deal only with reviews of a public health nature.

The preparation of abstracts will be in the hands of Dr. Arthur Lederer, Director of the West Virginia State Hygienic Laboratory. Experience and training have given Doctor Lederer excellent qualifications along these lines, and we may look to him for an interesting and valuable note section.

The "Association News" will serve to remind us that the Association is doing its work throughout the year, and not at annual meetings alone. News will be given out regarding the work of the central office, the executive committee, and special committees; and it is requested that section officers send each month such items as would be of general interest to the Association members.

THE PERIOD AFTER "PER CENT."

In common with other scientific publications, the JOURNAL has in the past used the dot after "per cent." The expression is an abbreviation of the Latin *per centum*, hence the custom.

There are at present a number of objections to the practice, however: first, it causes needless inconvenience; second, the period may be mistaken as indicating the end of a sentence instead of an abbreviation; third, it produces a hybrid expression. "Per cent." should be either Latin or English. That it is not Latin is indicated by the absence of italics, which even purists omit. Then, if English, why hang on to the period, which refers it back to *per centum!*

Ergo, vanish the dot after January 1, 1918.

Contributors to the JOURNAL are asked to take notice. We hope that the editors of other scientific journals will take the question under advisement.

THE DETERMINATION OF ICE CREAM AS A FACTOR IN THE SPREAD OF TYPHOID FEVER INFECTION.

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Surgeon, United States Public Health Service, Washington, D. C.

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Character. Each of the outbreaks was somewhat explosive in character. The periods of causation appeared to be about one month in duration. In each instance, however, between 30 and 40 per cent. of the cases developed within a period of seven days, suggesting that the outbreak may have been caused in large part by infection distributed in one day. The cases generally appeared in duration of attack, in severity of symptoms and in fatality to strike a medium between the aver-

age for outbreaks caused by water-borne infection and the average for outbreaks caused by milk-borne infection. A particularly interesting feature was the frequency of short prodromal periods. A large majority of the cases gave a history of prodromes for about three days. The sudden development of severe symptoms causing the person to take to bed at once was much less frequent than is the rule in instances of milk-borne infection.

Dosage. The number of cases to develop among persons who within the two years prior to the attack had received anti-typhoid inoculation suggested that the dosage of infection, as has been found to be the case in milk-borne infection,* was sufficient to overcome the resistance furnished by the inoculation. The proportion of the population of Birmingham and Chattanooga which prior to the outbreaks had been inoculated against typhoid is not known. It is improbable, however, that it reached 10 per cent. Between 5 and 10 per cent. of the cases in each outbreak gave a history of having had the inoculation within two years prior to onset of illness. Whether the vaccine which had been used in these persons was of standard potency is not known. But along with the outbreak in Chattanooga, a group of cases of typhoid fever developed among soldiers at Fort Oglethorpe, Ga., who had been exposed to the ice cream supply. All of the cases in this group were in persons who within the two years—and some within three months—prior to attack of illness had been inoculated with army vaccine. It is assumed that the potency of the army vaccine was up to standard.

*Geiger, J. C.: A milk-borne epidemic of typhoid fever due to the use of polluted water, with five failures of typhoid immunization.—Jour. A. M. A., March 31, 1917, p. 978.

Determination of Ice Cream as Vector of Infection

In extensive and explosive outbreaks of typhoid fever in cities, such as the one in Birmingham and the one in Chattanooga, the general epidemiological features suggest that the vector of infection has been some drink or food extensively distributed over the city. The geographical distribution and the class of persons especially affected, if ascertained with a reasonable degree of accuracy, tend to eliminate flies, personal contact and local insanitary conditions as preponderant factors in the spread of the infection. To bring under reasonable suspicion or to eliminate definitely a water supply or a milk, ice cream or other food supply, good leads can be found as a rule only by a careful collection of detailed data at the homes of the individuals attacked with the disease.

Accurate Collection of Data. Definite histories about one's use of water supplies and milk supplies are as a rule more easily obtainable than is the history of exposure to ice cream supplies. One who is fond of ice cream and who is able to indulge freely in this delicacy will usually, within any period of two or three weeks in the summer season, have eaten ice cream in a number of different places. Free users have difficulty in recalling even the majority of the places at which

they have recently eaten ice cream. The most important light on the situation may be obtained from the histories of persons affected who have eaten ice cream only a few times—perhaps but once—within the two or three weeks prior to onset of illness. Whenever practicable, the patient should be interviewed. Unless the interview at the home of the patient and at the other places at which the ice cream was eaten is conducted painstakingly, tactfully and thoroughly, the history of exposure of the person affected to the infected ice cream supply may be readily missed. The following is typical of many instances in the course of the investigation in Birmingham and Chattanooga: The mother of the boy ill with typhoid is interviewed.

QUESTION. "Did your son eat ice cream within the two or three weeks before he took sick?"

ANSWER. "No, he did not like ice cream."

Q. "Are you sure he did not eat it at all?"

A. "He may have, but he certainly did not eat it often."

Q. "Can you recall any time when he did eat it?"

A. "Let me see. Why, yes, now I remember, he did eat ice cream once at the drug store down here at the corner."

Q. "When was that?"

A. "It was about two weeks before he took sick."

Q. "Do you know what ice cream is served at the drug store?"

A. "I think it is the 'A' ice cream."

Q. "But you are not sure?"

A. "No, I am not sure."

Q. "Do you think the little boy ate ice cream at any place besides this drug store?"

A. "No, I'm pretty sure he did not."

It is then ascertained that the patient is well enough to be interviewed.

Q. "John, how about ice cream, did you eat it sometimes in the two or three weeks before you got sick?"

A. "Yes, sir, every now and then."

Q. "Where did you eat it?"

A. "At the corner drug store."

Q. "Anywhere else?"

A. "Yes, at the confectionery shop across the street.."

Q. "About how many times in the three weeks before you got sick did you eat ice cream at the confectionery shop?"

A. "Three or four times."

A visit is then made to the drug store and to the confectionery shop and the proprietor at each is interviewed.

Q. "What ice cream do you sell?"

A. "B's."

Q. "Any other?"

A. "No."

Q. "Have you sold any obtained from any manufacturer other than 'B' within the last six months?"

A. "No, I've been getting my supply from 'B' for over three years."

Q. "You have not run short at any time within the last eight weeks and bought a part of your supply from some other manufacturer?"

A. "Why, yes, for two or three days sometime ago 'B' was unable to supply me and I bought from 'X'."

Q. "Will your books show when that was?"

A. "Yes (looking at books), it was July 15, 16 and 17." The onset of illness of the patient was July 28.

Implication of Ice Cream Supply. By carefully collecting in this way the data about foods and beverages, evidence may be obtained early in the investigation of an outbreak caused by ice cream borne infection pointing to the ice cream supply which is responsible. The proportions of cases giving a history of exposure to the different ice cream supplies must be compared with the proportions of the total ice cream supply of the city which are furnished by the different dealers before a conclusion is reached that the number of cases among the users of ice cream from any one supply is excessive. In the Birmingham outbreak 55 per cent. of the cases gave a definite history of exposure to one ice cream supply which furnished less than 20 per cent. of the total supply of ice cream consumed in the city. In the Chattanooga outbreak 86 per cent. of the cases gave a definite history of exposure to one ice cream supply which furnished, according to the most reliable evidence obtainable, about 30 per cent. of the total supply of ice cream consumed in the city. In each of these outbreaks the number of cases among the users of ice cream from other large supplies was roughly proportionate to the amount of ice cream distributed. In outbreaks such as the one in Birmingham and the one in Chattanooga, the preponderance of cases among the users of ice cream from one supply is regarded by the writer as practically conclusive evidence that the ice cream supply has been the vector of the infection, unless it can be established beyond reasonable doubt that the ingredients of the ice cream and the ice cream itself have been collected and handled in such a way as to prevent the introduction of infection, or that they have been treated in such a way as to insure destruction of whatever infection may have been introduced into them. The finding of a case of typhoid fever or a carrier of typhoid infection at one of the farm sources or at the factory furnishes corroborative evidence, but does not appear essential to the reaching of a definite epidemiological conclusion. The case or carrier furnishing the infection may have recovered or have left the premises before the search for the human source of the infection at farms and factory is begun. The ice cream supplies concluded to be responsible for the outbreaks in Birmingham and Chattanooga were found at both farm and factory sources to have been exposed through fingers, flies and other agencies, to contamination with human excreta. In the period of causation of the Birmingham outbreak three cases of typhoid fever existed at one of the dairy farms supplying milk used in the manufacture of the implicated ice cream supply. The existence of the cases and the insanitary conditions in respect to the disposal of human excreta on these premises were suggestive, but not *proof* that the infection causing the outbreak had its origin at this farm. The mixture for making the ice cream implicated in the Birmingham outbreak was not pasteurized nor otherwise treated so as to

destroy whatever infection may have been introduced into it at its sources. The mixture for making the ice cream implicated in the Chattanooga outbreak was invariably, according to the evidence, run through a "flash" pasteurizing machine, but it was positively established that this machine on some occasions did not pasteurize.

Elimination of Other Potential Factors. In both the Birmingham and the Chattanooga outbreaks factors other than ice cream likely to operate in the spread of infection causing such outbreaks were eliminated on epidemiological evidence obtained from field and laboratory studies. There was no suggestive preponderance of cases among the users of milk from any supply other than those used in the making of the implicated ice cream. In the periods of causation of the outbreaks the public water supplies were free from all evidence of dangerous pollution. The number of cases giving a history of exposure to water supplies other than the public city supplies was not sufficient to signify that these water supplies had played a very considerable part in the spread of the infection. The public water supply of Birmingham is obtained from two different sources and treated and distributed from two different plants. In the period of the outbreak the prevalence of typhoid fever was just about the same in the areas of the city supplied with water from the two different sources.

Conclusions.

1. The part played by ice cream, though probably not relatively so great as the part played by water, milk, fingers or flies in the spread of typhoid and other infections, is important and deserving of the serious attention of health officials.

2. The dosage of typhoid infection in ice cream may be sufficient, as is the case with milk supplies, to overcome the additional resistance furnished by anti-typhoid inoculation and for that reason the elimination from the dietary of vaccinated persons, including the military forces, of ice cream which is not determined with reasonable certainty to be free from the likelihood of infection is of particular importance.

3. Unless investigations of typhoid situations are conducted painstakingly and thoroughly, evidence which would definitely establish an ice cream supply to be the vector of infection may be missed.

4. Extensive outbreaks of typhoid fever caused by ice cream borne infection can be readily determined by careful epidemiological studies, but even very careful and thorough investigations may fail to determine the medium of conveyance in small numbers of cases caused by ice cream borne infection.

5. The exercise of cleanliness in the collection and preparation of all ingredients entering into the composition of ice cream supplies, the proper pasteurization of ice cream mixtures, and the exercise of a high degree of cleanliness in the manufacture and distribution of ice cream—all under rigid and adequate official supervision—are highly indicated in order that this delectable and economic delicacy may be distributed freely and safely for human consumption.

BACTERIAL CHANGES IN UNICED SPECIMENS OF WATER AND DESCRIPTION OF A CONTAINER FOR THE TRANSPORTATION OF ICED SPECIMENS OF WATER FOR BOTH CHEMICAL AND BACTERIOLOGICAL EXAMINATIONS.

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INTRODUCTION.

THE purpose of the investigation here reported is to note the bacterial changes that take place in uniced specimens of water with the object of determining to what extent reliance may be placed on the results of bacteriological examinations of water thus sent to a laboratory some distance away.

There is no longer any question as to the desirability of making both chemical and bacteriological examinations to determine the potability of water.

Some years ago, when as a rule, only chemical examinations were made, it was customary to send water considerable distances to laboratories. There was consequently an interval of from several hours to several days between the time of collection of the specimen and the time of making the examination. Such was not a matter of so much importance since chemical changes do not take place as rapidly as bacterial changes and do not, therefore, as materially modify the conclusions reached relative to the potability of the water. On the other hand, it is well known that bacteria will multiply rather rapidly, at least for a time, in water which comes from a cool source of supply and which is allowed to remain at ordinary room temperature. These changes are sufficient to vitiate the results of bacteriological examinations if dependence were placed on such alone.

During recent years, constantly increasing provisions have been made by state authorities for the examination of water on a state-wide basis at or through some central laboratory. Although it is obviously desirable to make the examinations at the place where the water is collected in order that the examination may be made, or at least started, immediately after collection, it is also very obvious that such a procedure involves very much more expense than present appropriations will permit. It is possible also, that the greater expense which would thus be incurred is not justified by the results obtained. As far as chemical examinations are concerned, with the exception of such determination as dissolved oxygen, it does not make so much difference whether such are made at the place where the water is collected or at some distant laboratory since the changes which occur during transportation are, as a

rule, of less importance. On the other hand, the bacteriological changes are such as to have led to a diversity of forms of practice relative to the method of conducting bacteriological examinations. Some make, or what amounts to the same thing, start the examinations at the place of collection. Others send small specimens, packed in ice, to a distant laboratory. It has been demonstrated that when such is properly done, practically no bacterial changes will take place within the time usually required to send a specimen across a state. This means the sending of two specimens of water from each source of supply—one small one, iced, for bacteriological examination, and one larger one, uniced, for chemical examination, or going to the considerably greater expense of sending a large specimen in a container with ice. The question may, therefore, properly be asked, if with the nature of the source of supply and the results of the chemical analysis known, it is not possible to depend on the results of the bacteriological examinations of uniced specimens of water—knowing what changes in bacterial content are likely to occur. It is for the purpose of answering this question that a series of examinations were instituted.

Method of Investigation to Determine the Nature and Extent of Bacterial Changes in Uniced Specimens of Water.

Specimens of water were collected from forty different sources of supply in the neighborhood of the laboratory. The sources of supply were of various kinds and represented various degrees of pollution with sewage material. Specimens for bacteriological examination were collected in sterile, rather tall, one-gallon glass-stoppered bottles —the same type of container used for the submitting of specimens from various parts of the state to the laboratory. The stoppers were covered with a piece of clean cloth

Fig. 1.—The Old Container.

which was tied down around the neck of the bottle. These bottles were placed in felt-lined cases such as are regularly used in the transmission of specimens. They were returned to the cases promptly after examination. An additional specimen was secured for chemical analysis. Immediately on arrival at the laboratory, the temperature of the water was taken with sterile thermometers. One cubic cen-

timeter and one-tenth cubic centimeter quantities were then plated on nutrient agar and lactose-litmus agar and introduced into tubes of lactose broth—all media having been prepared in accordance with methods given in the second edition (1912) of "Standard Methods of Water Analysis" of the Laboratory Section of the American Public Health Association. The nutrient agar plates were placed in an incubator at 20° C. and the litmus-lactose plates and tubes of lactose broth in an incubator at 37° C.

This procedure, including the taking of the temperature and the inoculation of the media and pouring of plates, was repeated at the end of 8, 24, 48, and 72 hours after the collection of the specimens. The bottles were thoroughly shaken before specimens were removed for examination.

The nutrient agar plates were removed from the incubator at the end of 48 hours and the number of colonies counted. The litmus-lactose agar plates were examined at the end of 24 hours, and a count was made of both the total number of bacteria and the number of red colonies. The presence or absence of gas formation in the tubes of lactose broth was made after an incubation of 48 hours. A sanitary survey of the source of supply and a chemical analysis of the water was also made.

Results of Examinations of Uniced Specimens of Water.

The results of the examination are set out in the accompanying table. It was thought best to primarily list the waters in three classes—namely,

FIG. 2.—BACTERIAL CHANGES IN UNICED WATER SAMPLES.

Hours	Sample Number	Temperatures					20°C.					37°C.					Red Colonies					Gas				
		0	8	24	48	72	0	8	24	48	72	0	8	24	48	72	0	8	24	48	72	0	8	24	48	72
Good	38	24°C.	24°C.	25°C.	23°C.	22°C.	49	90	350	1500	1200	0	0	10	600	16	0	0	1	0	1	+	−	−	−	+
	40	21°C.	24°C.	25°C.	23°C.	22°C.	12	29	60	120	55	0	0	0	4	210	0	0	1	0	1	−	−	−	−	−
Ave.							15	43	152	604	556	4	2	4	185	163	0	0	−1	0	−1	4− 1+	5− 2+	4− 2+	3− 3+	4− 2+
Ques.	13	16°C.	21°C.	25°C.	25°C.	24°C.	320	425	600	1200	600	46	55	600	48	150	4	3 Acid	6	6	6	+	+	+	+	+
Ave.							406	493	1009	1325	1148	44	30	181	219	195	1	1	1	1	1	2− 4+	3− 3+	3− 4+	0− 6+	0− 6+
Bad	18	16°C.	21°C.	25°C.	25°C.	24°C.	500	300	1500	4000	800	200	35	13	19	11	2	1	0	0	1	+	+	+	+	+
Ave.							279	123	404	914	352	49	21	134	8	80	1	1	0	−1	−1	1− 5+	1− 5+	1− 5+	1− 5+	3− 3+
Ave. of 40 Samples							280	527	726	1185	827	52	138	139	214	384	2	2 2	2.5	2.5	2.7	11− 29+	15− 25+	11− 29+	10− 30+	13− 27+

good, questionable, and bad, as determined by both a sanitary survey and a chemical analysis—having in mind the question of sewage pollution. There were a number of specimens which were considered "good" by either the sanitary survey or the chemical analysis but "questionable" or "bad" by the other. Because of the undesirability of introducing a rather uncertain factor, the bacteriological findings of these specimens have not been included in this table. Both one cubic centimeter and one-tenth cubic centimeter quantities were used for all of the bacteriological determinations. It was found, however, that the difference in results was so slight that only the one cubic centimeter findings were tabulated.

These examinations were made in the month of July; consequently the temperature and, likewise, the bacterial changes are more marked than would be the case during the greater part of the year. It has been shown that bacterial increase is greater in small bottles than in larger ones, due no doubt to the greater rapidity in the rise of temperature. For that reason, as well as for the amount of water required for chemical analysis, one gallon containers were used in collecting the specimens.

Deductions Based on the Examination of Uniced Specimens of Water.

1. The average total number of bacteria per cc. in six specimens of water which were regarded as "good" by both a sanitary survey and a chemical analysis, was very low (only 12) when the water was first collected, increased to slightly more than 100 at the end of 24 hours, and to nearly 700 at the end of 48 hours.

2. The average number of bacteria per cc. in the above named specimens of water incubated at 37° C. remained low (4) for the first 24 hours but increased to almost 200 by the end of 48 hours.

3. There were no acid producers in the above-named specimens of water at the beginning and, with one exception, none appeared within 48 hours. It would of course be expected that with the increase in the number of bacteria, there would likewise be some increase in the number of any acid-producers that may be present.

4. Two of the six above-named specimens of water contained gas-producers at the beginning. This proportion was not materially increased during the first 72 hours after collection. The same absence of increase of gas-producers was noted in the entire group of 40 specimens. It would, therefore, seem that about as much dependence may be placed on the "gas formation" determination at the end of 48 or 72 hours as at the time of collection.

Necessity of a New Water Container.

It will be seen that the results of the bacteriological examinations of uniced specimens of water are not always satisfactory. Soon after these determinations were made, we learned of the very satisfactory results which had been obtained by Penniman and Enslow of the Maryland State Board

of Health with small samples of water for chemical analysis. We concluded that if we could confirm the results of Penniman and Enslow's work to our satisfaction, the icing of a sample of such size would not be as prohibitive in cost as the sending of a gallon container iced. We found the results of the chemical examination of such a small sample of water to be satisfactory. We therefore devised a new water container which we have since adopted as the standard water container of the laboratories for the Iowa State Board of Health.

Description of a Container for the Transportation of Iced Specimens of Water for Both Chemical and Bacteriological Examinations.

Our container consists of a wooden box lined with galvanized iron. Between the galvanized iron and the wood is a half-inch layer of felt, the purpose of which is to reduce the effect of outside temperature. The inner chamber is 9″ x 9″ x 10″ and since the wood used in the box is ¾″ stock, the outside dimensions are 11½″ x 11½″ x 13″. The top of the box is hinged and is provided with a hasp so that it may be locked or sealed. There is a handle on the top of the box.

The bottle used is a 500 cc. salt-mouth bottle 7½″ high and 2¾″ outside diameter. It is sterilized by hot air. The mouth of the bottle is protected by a piece of sterile aluminum foil covered by a piece of muslin which fits over the stopper and is tied down around the neck of the bottle. The ends of the strings are sealed over the top of the bottle to make sure that the bottle has not been tampered with after it was sterilized.

The bottle of water is slipped into a galvanized cylinder 4″ in diameter by 9″ high which is furnished with a slip cover. This cylinder is of such size that it cannot fall over in the box.

Fig. 3.—The New Container.

Its purpose is, of course, to protect the bottle from breakage and from the water produced by melting ice.

The sterile bottle in the cylinder is packed in excelsior when the outfit is shipped out. Some of the excelsior is removed and ice is added to the packing when the sample of water is forwarded to us. If about ten pounds of ice is used, some of it is

usually unmelted when we open the container at the laboratory.

Deductions Based on Examinations of Both Iced and Uniced Specimens of Water.

1. The temperature of the water kept in the containers just described falls slightly during the first 24 hours, but has become considerably increased by the end of 48 hours.

2. The number of bacteria tends to become slightly diminished during the first 24 hours as determined by counts of plates kept at both 20° C. and at 37° C. By the end of 48 hours, however, the number has become considerably increased.

3. The presence of red colonies on litmus-lactose plates, or of gas-production in lactose broth, is not materially influenced either by the icing of the specimen of water or by the length of time which has elapsed after the water has been collected that the examinations are begun.

Conclusions.

1. Water to be sent to a distant laboratory to be examined bacteriologically should preferably be packed in sufficient ice to prevent an increase in the number of bacteria before the time of examination.

2. The water container herein described for the sending of one iced sample for both chemical and bacteriological examination will prevent an increase of the temperature of the water to be examined for at least 24 hours and therefore meets the requirements of a water container for a state laboratory where the distance of shipment is not over three hundred miles and where the shipping facilities are such that the specimen can be delivered to the laboratory within 24 hours of the time of collection.

3. The bacteriological examination of water sent uniced in large (one-gallon) sterile containers may be regarded as "safe" if the water seems to be "safe" as determined by the sanitary survey and the chemical examination and if the bacteriological findings are properly interpreted in view of the changes which may occur in water kept under such conditions, and accordingly come within the following provisions:

(a) The number of bacteria on agar plates at 20° C. does not exceed 200 per cc. if plated within 24 hours after the time of collection, or 500 if not plated until 48 or 72 hours after collection.

(b) The number of bacteria on litmus-lactose plates at 37° C. does not exceed 50 per cc. if plated within 24 hours after collection, or 100, if not plated until 48 hours after collection.

(c) There is an absence of colonies of acid-producing bacteria which are also gas-producers.

4. The total number of bacteria in uniced specimens of water which are (or probably are) polluted with sewage material, as determined by both a sanitary survey and a chemical analysis, is so high that it is not as safe to establish limits of bacterial counts, as in case of water that would be regarded as safe by a sanitary survey and a chemical analysis.

5. Specimens of iced water which

are not plated until after most or all of the ice has melted or, with the use of the container described in this paper, until after 24 hours after such specimens are collected, should be subject to the interpretation of the findings of uniced specimens of water except of course that the time when the temperature began to increase should be regarded as the time of collection.

Received for publication, October 30, 1916.

COMPARABILITY—THE WILL-O'-THE-WISP OF CAUSE OF DEATH STATISTICS?

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Read before the Annual Meeting of the American Public Health Association, Section on Vital Statistics, Washington, D. C., October 19, 1917.

IT IS desired to call attention to the fact that the caption of this paper is an interrogation; it is just as earnestly desired to emphasize the fact that the subject discussed is a restricted one. The writer does not wish to convey the impression that he does not believe in the comparability of the published general death-rates of the Registration Area and its main subdivisions. It is intended to limit the discussion to the death-rates for the various diseases and causes of death and to raise the question as to the comparability of a very large proportion of them—that is of their value as indices of variations in the actual death-rates during long periods of years. Do these rates approximate what has actually happened, or do they merely picture the varying trustworthiness of the reports of causes of death?

The writer's experience of over seventeen years in the work of editing and translating into cold figures the reports of diseases and causes of death by physicians, coroners, and other informants has brought him into more or less intimate touch with many of our foremost vital statisticians and public health workers. As many of these gentlemen use the published death-rates for most diseases as indices of the approximate mortality due to those diseases during long periods of years, it is principally to these men that it is desired to put the following questions: First, are these figures comparable or even approximately comparable? Second, will they ever be even approximately comparable? It is his great respect for the ability and honesty of those of his associates in mortality statistics work, who more or less frequently use these death-rates as the bases for important conclusions, that the writer is asking them these *questions*, and is *declaring* nothing beyond some of his own personal views based on his own personal experience.

For convenience the rates quoted

later will be those of the Registration Area. This, of course, is not a constant area. The matter of its varying make-up, however, is mentioned here, not because it is desired to use it as an argument in connection with the comparability of the death-rates, but to lay stress upon the fact that it is intended to disregard this part of the situation entirely. It is the sincere belief of the writer that his conclusions as to the comparability of the published death-rates for various diseases are just as well founded with relation to a constant area (the registration states of 1900, for example) as they would be for one in which the included territory has changed almost from year to year. Neither is it desired to discuss the factor of immigration, and its effect upon the proportion of the various race stocks; of changing age and sex distribution of populations; or of other considerations which indicate that the rates for the population of any given area 10 years ago are rates which apply to a population different in many respects from that of the present time. We can face the situation better and discuss it to greater advantage by forgetting, for the present, that the factors just mentioned affect the comparability of published death-rates.

It is not intended to discuss, at length, the history of mortality statistics—and more particularly of statistics of the various diseases and causes of death in this country.

It is not intended to discuss, technically, the changes in classification standards and methods which, as any vital statistician must know, have affected and will continue to affect the comparability of statistics of death from the various diseases for many years to come. Still, the first reason why many of the published death-rates for years prior to 1900 are not comparable with those for that year and subsequent years is that the classification then in use was essentially different from the International Classification, under the first revision of which our statistics of cause of death were compiled for the decade 1900–1909, and the second revision of which is our present authority. Again, the Census Bureau, in its annual reports, specifically warns against attempts to compare death-rates for certain diseases and groups of diseases for years of the period 1900–1909 with those for years of the present decade. Nevertheless, it is by no means unusual for careless or incompetent analysts to disregard these admonitions and to make the most remarkable deductions concerning the mortality from certain diseases throughout long periods of years. These deductions, unfortunately, the uninitiated, and the lay press are apt to take seriously. We need only refer to the published statements that have appeared in the annual census mortality reports since 1910 for examples of a score or more of diseases, disease groups, or "titles" of the International List concerning which we are warned that the published rates are not comparable for years prior to and subsequent to the second revision of the classification in 1909.

The effect of the factor of classification changes on the comparability of the published death-rates of

one period with those of others is, in the opinion of the writer, so evident, that no one familiar with the changing methods will attempt to controvert it. If, under a given title heading in 1900, we assign all deaths reported from A, B, C, and D, and proceed to tabulate the combined mortality of the four as a total, with no statistical segregation of the mortality reported from each, and if in 1910 we tabulate under the same title heading only A, B, and C, and place D under a second heading, with no statistical segregation of the number of deaths reported from it, is it not quite evident that the death-rates for 1900 and 1910 for both title headings are not comparable? Is the situation not complicated further, if other changes of terms tabulated under these same headings are made?

Classification revision is, then, a considerable factor in its effect on the comparability of death-rates for many causes. But, withal, it is submitted that it is a minor factor compared with others which are in evidence. The careful and the initiated analyst knows the pitfalls here and will not attempt the more involved comparisons—at least he will make due allowance for the deficiencies of his basic data and will qualify his conclusions accordingly.

We now come to what seems to be the real, insurmountable obstacle. As late as 1904 causes of death were classified by the Bureau of the Census practically as reported. Beginning with 1905 the first real efforts were made to "go behind the returns." That is, to a very limited extent, efforts were made to obtain additional data in cases where statements on the transcripts of death certificates gave particularly incomplete information. These efforts were confined, at first, to a few of the worst deficiencies. The reports covering violent deaths were among the worst received in those days. Here is an example of the procedure: *Some* of the returns of "fracture" were not immediately classified (as before) under the International List title, the caption of which is "fractures." Lists of such cases, together with a number of other indefinite reports of violent deaths, were sent by the Bureau of the Census to state and municipal registration offices with the request that more specific information be secured. As a result, the totals of fatal mining accidents, machinery accidents, homicides, and vehicular accidents began to increase, as well as those of other titles relating to specifically defined violence. Some of the other reports which these lists sent to registration offices contained were "poisoning," "carbolic acid poisoning," "asphyxia by gas," "drowning," "gun shot wound," "cut," "accident," "accidental wound," "concussion of brain," and several others. The effect of this was the addition of many deaths to the homicide and suicide totals. During the first four years in which these lists were sent out, it was not possible to cover more than a small portion of the indefinite reports received. Nevertheless, the few that were sent out changed the published death-rates very materially, and this propaganda of the Census Bureau is largely responsible for the higher death-

rates which now appear for homicides and suicides as compared with those of the earlier years of the first decade of the century. Returns of "operation," "surgical shock," etc., were transferred to the totals for appendicitis, hernia, gall stones, cancer, diseases of the prostate gland, uterine tumor, ovarian tumor, and other titles.

But, in our study of the effect of this propaganda on the comparability of the published death-rates, let us not lose sight of this important fact. As the years went by the vigilance of the Census Bureau increased. Year after year these lists of unsatisfactory reports became longer as more of the indefinite reports were queried. The constantly increasing persistence with which the Census Bureau insisted on more accurate basic data has unquestionably been instrumental in securing, year after year, higher proportions of accurate basic data.

Then, if the writer's recollection is correct, came the time when the effect of this campaign began to be visible in a gradually decreasing proportion of such returns from many of the older registration states and cities. Some of them, at least, began campaigns of their own to improve the quality of the returns; others prosecuted with greater vigor campaigns already instituted. The effect of this work was perfectly evident to the Census Bureau, and in the text of several of its annual reports it has not hesitated to call attention to the obvious influence of this progaganda upon certain published death-rates. Can we then seriously question the statement that the published death-rates computed on the basis of the returns as received *before* these efforts were made, must be compared with many reservations, if at all, with those of the later and more enlightened day?

Lest the accusation be made that the writer is merely generalizing, it becomes necessary to give a few examples of cases in which the published death-rates do not represent, in his opinion, the actual trend of the mortality.

Let us take the case of measles. This is an epidemic disease in which there are frequent and sharp fluctuations in the mortality. The mortality for this disease is always understated, but this understatement obtained to a much greater degree in the earlier than in the later years. It is believed that comparisons of the death-rates of two or three recent consecutive years give, as a rule, a fairly good picture of what changes have taken place. But when one attempts to compare the apparent death-rate from this disease for the year 1900 with that for 1910 or 1915, there is another story. According to the Census Mortality Reports for 1915 the published death-rate for this disease was increased for that year more than 7 per cent. by the addition of 242 deaths, of which 94 per cent., on the basis of the original reports, would have been charged to bronchopneumonia or to "pneumonia." These deaths were finally charged to measles because the physicians, in answer to Census inquiries, stated that measles was the primary cause. It is safe to say that a large and yearly increasing number of deaths, beside these, have been classified under measles in the

past ten or twelve years as, more and more, physicians have come to realize the importance of stating the primary cause on the certificates, as well as mere complicating or terminal symptoms.

For reasons similar to those which obtain with respect to measles it is contended that, to a very considerable degree, the same changes are operative in their effect on the comparability of the published death-rates for whooping-cough and influenza. Information obtained from letters of inquiry to the physicians, in conjunction with increased precision of original statements of cause of death, have raised materially the published death-rates for such titles as tuberculous meningitis, syphilis, gonococcus infection, alcoholism, epidemic cerebrospinal meningitis, diseases of the ears, puerperal albuminuria and convulsions, puerperal septicemia, infantile diarrhea, injuries at birth, lack of care, and excessive cold. They have reduced very considerably the published totals for such titles or subtitles as septicemia, simple meningitis, paralysis without specified cause, convulsions, pneumonia, pleurisy, pulmonary congestion, simple peritonitis, acute nephritis, congenital debility and others. One needs only to look at the text comments on the accuracy of mortality statistics in the more recent annual Census mortality reports to find more detailed information about these changes.

But let us take up the practical task of trying to picture, by means of the published death-rates alone, what has happened in the mortality from a number of causes of death.

A great deal gets into print about the decreasing death-rate from tuberculosis. A bright picture is painted. As a matter of fact the story told by the published death-rates is *by no means bright enough*, for there has been a greater decrease in the mortality from tuberculosis than the figures indicate. But this is their story: In the year 1900 the death-rate for tuberculosis in the Registration Area was 201.9 per 100,000 population. With a few minor exceptions a continuous decrease is shown, year after year, until we read that for 1915, the latest year for which the rate is now available, the mortality had decreased to 145.8, a fall of 28 per cent. Closer analysis, however, discloses that despite the fact that during these years, to an increasing extent yearly, there has been a tendency to report the tuberculosis on death certificates—*despite* this fact, the published rate has continuously decreased. If there had been the same percentage of accurate statement in the early years that there has been in the later ones, it is safe to say that the rates shown for those earlier years would have been much higher, and in consequence, the percentage of decrease shown by comparison of the published rates of 1900, 1905, and 1910, with those of 1915 would have been considerably greater and much more representative of the real decrease in tuberculosis mortality than are the figures as they stand. Let us look at the decreasing totals for diseases under the names of which deaths from tuberculosis are often concealed. Under the first of these, "hemorrhage," it is true, only

a comparatively small number of deaths are classified. Nevertheless, the apparent death-rate from this cause has declined from 4.3 in 1900 to .4 in 1915. This means, that the mortality charged to it is only a little more than one eleventh of what it used to be. In 1900, 1,324 deaths were charged to this cause; in 1915 there were only 293. It is safe to say that many of these which now go into the tuberculosis column would have been classified in former years, as deaths due to "hemorrhage." A more important factor, numerically, is chronic bronchitis, for which there has been an almost continuous decline in the published death-rate from 1900 to 1915. In the first of these years the published mortality for this disease was 19.3, whereas in 1915 it had been reduced to 7.7. Unquestionably, we have here the explanation for the classification of a great many deaths under the tuberculosis total, which under former conditions, would not have been so assigned. Here a much larger number of deaths is involved than in the case of "hemorrhage." The published death-rate for pleurisy was 4.7 in 1900 and 3.4 in 1915. That for "pulmonary congestion" declined steadily throughout the period from a maximum of 11.4 in its first year to a minimum of 2.4 in its last. Similarly, there has been quite a steady and consistent decline in the death-rate from the residual title known as "other diseases of the respiratory system." Under each of these there can be no question but what deaths that were really due to tuberculosis were concealed to a much greater degree in the earlier than in the later years. There can also be little doubt but what the immense reduction in the published total for "ill-defined diseases" has been responsible for the addition of many deaths to the tuberculosis total. Despite all these factors, each and every one of which should raise the rate, the published death-rate has declined, and there is every reason to believe that the decrease has been considerably greater than the figures indicate.

We may pass very briefly the very considerable increases shown in the published death-rates for syphilis and gonococcus infection. These indicate that there has been an increase of approximately 150 per cent. in the former and 400 per cent. in the latter, since 1900. Does any one question the statement that the figures in these cases are not true pictures, nor are they approximate pictures, of the degree of change in conditions.

We next come to the rates for cancer and other malignant tumors, for which the published death-rates show a practically continuous increase throughout the period 1900 to 1915. The indicated increase here is from a death-rate of 63 per 100,000 population in 1900 to 81.1 in 1915, or 29 per cent. It is the firm opinion of the writer, that while there has been actually an increase in the cancer rate in Registration Area and in the United States, it is by no means as great as these figures indicate. In few diseases has the Census Bureau's educational propaganda brought about increased precision of statement of the cause of death to the extent that has obtained

for deaths due to cancer. Again, if the returns of earlier days had been as carefully scrutinized as those of later years, the cancer death-rates for those earlier days would have been much higher than those which are in evidence, and the percentage of apparent increase much smaller. Many deaths now go into the cancer total which in earlier days would have been classified as "tumors," under "simple peritonitis," and under the total of "ill-defined diseases." In recent years it has been quite a usual experience to return for further information cases where death is reported as due to such causes as "disease of the stomach," "disease of the pharynx," "disease of the intestines," and of other organs, with the result that additional information has been furnished to the effect that the real cause was *malignant* disease. Thus, the deaths were changed from these various totals to the cancer total. An investigation of this subject by the Statistical Bureau of the Metropolitan Life Insurance Company during the period 1911 to 1916 showed, that with the exception of the last year, there was a tendency toward a *slight* increase in the cancer mortality among its industrial policyholders. The Metropolitan began its study of the mortality of its industrial policyholders in 1912, although the first year to which the study relates is 1911. It began its study, however, after it had been very clearly demonstrated that it is a paying procedure to investigate very carefully the indefinite returns, and as this policy was followed throughout the period covered by its investigations, and as there has been no revision of the classification during the period to which they relate, it is believed that the rates for these six years are fairly comparable. There has been no such increase in the mortality from cancer among Metropolitan industrial policyholders as is indicated for the Registration Area by the published returns of the Census Bureau, and for 1916 as compared with 1915, there was actually in evidence a slight *decrease* in the death-rate.

The Census figures show that between 1900 and 1915 there was a seeming increase in the mortality from apoplexy of 17.5 per cent. For the same period they show for "paralysis without specified cause" a decrease of 65.3 per cent. We, who have read the replies of thousands of physicians to query letters about "paralysis," have had tangible evidence of one reason why the "paralysis" rate appears to be declining, and the apoplexy rate appears to be rising.

The figures for some of the numerically less important diseases afford excellent examples of what a handicap confronts the man who takes the published death-rates at their face value without knowledge or consideration of the circumstances under which they were compiled. For example, there have been no important changes, since 1900, through revision of the classification, in the list of diseases tabulated under the heading of "diseases of the ears." Nevertheless, the apparent death-rate, showing year after year, an almost continuous increase, was in 1915 a little more than triple that of 1900. It will hardly be contended that there has been an actual increase in the fatal

cases of ear disease to the extent indicated. Here is what has happened. Hundreds of physicians who, in 1900, would have certified or did certify fatal cases of otitis media as due to the terminal condition, meningitis, have been, under the stimulus of educational propaganda, returning such cases in more recent years under the primary cause.

Without going into reasons in each case, it is the opinion of the writer that the published death-rates covering periods of years for all of the following titles are either utterly noncomparable, or need much more or less technical explanation, if used to illustrate the trend of mortality from these causes: Malaria, measles, scarlet fever, whooping-cough, influenza, dysentery, pellagra, all tuberculous diseases, syphilis, gonococcus infection, cancers, "tumors," acute rheumatism, chronic rheumatism, "other general diseases," alcoholism, encephalitis, meningitis, locomotor ataxia, "other diseases of the spinal cord," cerebral hemorrhage, softening of the brain, "paralysis without specified cause," general paralysis of the insane, "other forms of mental alienation," convulsions, "other diseases of the nervous system," diseases of the ears, acute endocarditis, the very important title *organic diseases of the heart*, diseases of the arteries, "hemorrhage," acute bronchitis, chronic bronchitis, bronchopneumonia, pneumonia, pleurisy, pulmonary congestion, asthma, "other diseases of the respiratory system," ulcer of the stomach, "other diseases of the stomach," appendicitis, hernia, cirrhosis of the liver, biliary calculi, simple peritonitis, acute nephritis, diseases of the bladder, diseases of the prostate, uterine hemorrhage, the entire class and practically every title included under Group VII—The Puerperal State, gangrene, congenital malformations of the heart, all of the titles listed under Class XI—Early Infancy,—senility, a considerable number of those listed under Group XIII—External Causes, particularly traumatism by firearms, and by cutting or piercing instruments; also a number of other titles, the deaths from which have been classified, more and more as the years have passed, under the homicide total rather than under accidental deaths. This emphasizes the noncomparability of the group of death-rates relating to homicide. There is hardly a title under the External Cause class, for which the death-rates are comparable for a series of years, and such comparisons should be made only with extreme caution and with knowledge of the factors which influenced their compilation.

We finally come to the great group under the head of "ill-defined diseases" which, from 1901 to 1905, included about 3 per cent. of the total number of deaths. For the year 1915 the deaths included under this group amounted to only about four-fifths of 1 per cent. of the total. The deaths representing the difference between these rates, and which in earlier days went into this ill-defined class, have, in increasing degree throughout the years, gone into other totals, thus affecting the comparability of these.

It is suggested—merely suggested—that diagnostic acumen is having its

effect, more and more each year, on the comparability of the death-rates for various diseases. If this is so, and if certain diseases are more often correctly diagnosed now than heretofore, no comment is needed on the effect of this factor on the published rates for such diseases; also on those under which the deaths caused by them were classified in earlier years through mistaken diagnoses.

It has been suggested to the writer in verbal discussion of this question of the comparability of death-rates, that it is probable that the errors involved are approximately compensating, and that, on account of the large number of cases involved, the death-rates for each disease give a fairly accurate picture of the trend of the mortality from that disease in accordance with what is known as the "law of large numbers," "law of averages" or "law of error." This viewpoint can not be successfully supported so far as the apparent death-rates for diseases are concerned. The reason is obvious: the basic data are not equally amenable to misstatement. If we tabulate one million deaths by sex, it may be presumed that mistakes in classifying deaths of males as females and of females as males will be approximately compensating. It will hardly be maintained, however, that physicians will misstate as many cases of actual puerperal hemorrhage merely as "hemorrhage" as they will misstate cases of "hemorrhage" as puerperal hemorrhage. Unless all efforts to improve the descriptions of causes of death have failed, it is obvious that the mortality formerly charged to the unsatisfactory and ill-defined titles is becoming, more and more, a part of the totals charged to the definite and satisfactory titles.

Is it not evident then, that when we seek to compare the more or less remote past with the present or immediate past, the admitted growing accuracy of the figures is evidence, in itself, that they are not comparable. The loss of comparability of death-rates of causes of death is the price that we must pay for the educational efforts which make for better statistics. No one who is at all informed disputes the assertion that figures of equal reliability are more comparable than those of unequal reliability. No one who has worked actively in this field disputes the improvement of our basic data. The only question is the *extent* to which comparability is affected and for what diseases and causes of death the rates are not comparable. It is believed that we can now safely state that, chiefly through the progressive spirit shown by the Census Bureau, we are out of the one-cylinder, solid-tire stage of cause of death classification procedure. During that stage, more energy was expended in blowing the horn than in improving the machinery of locomotion. The things that were current and timely according to the standards of other days, can not be measured in terms of and according to those of the present and more recent past. Great credit for the improvement in basic cause of death data must be given to the Census Bureau. If that bureau had been less progressive and had been content to publish its cause of death data as reported, ac-

cording to the standards of earlier days, we might have, today, less accurate statistics which would be comparable with those of other years, instead of statistics that are getting better and better as the years go on, but which are not so comparable, as the inevitable effect of their betterment.

For the reasons set forth, therefore, the writer believes that in very many cases the published death-rates for titles of the International List are absolutely noncomparable for extended periods of years. That is, they are noncomparable as even approximate pictures of the actual (not the reported) trend of the mortality from the diseases to which they relate. It is the further belief of the writer that with many other titles of the International List, the published death-rates give an approximate picture of the trend of the mortality only when handled by competent analysts who are familiar with the changes that have been operative during the past two decades. It is, to say the least, a grave statistical error to compare many of these rates as they are being compared today. No better example of the false impression that arises from such comparisons can be given than the contention of the Life Extension group concerning the increased mortality from degenerative diseases in the United States. While the writer is not prepared to state that there has been no increase in the mortality from degenerative diseases during the past few years, he is prepared to assert (there is no interrogation here) that a large part of the increase which they seek to prove by quoting the figures is due simply to more accurate reporting of causes of death and better "editing" of the reports, whereby the totals for organic heart disease, diseases of the arteries, and cerebral hemorrhage have been raised by tabulating under those titles deaths that previously would have been classified elsewhere.

Reverting then to the questions in the second paragraph: *one*, are these figures comparable or are they approximately comparable? and *two*, will they ever be even approximately comparable? It is the writer's opinion that many, if not the majority, of the published death-rates for the 189 titles of the International List are not comparable for long periods of years. As to the present and the future, it is the writer's belief that we are approaching the day when the majority of these death-rates may be safely compared with each other. Comparisons of consecutive years will always, in all probability, be more valid than those relating to widely separated years. There will always be classification changes. In the future when such changes affect the comparability of titles to a very marked degree, we should provide for the statistical segregation of deaths reported from those diseases which are changed from one title to another. The Registrar-General of England and Wales has set an excellent example along this line. The outlook, therefore, is not a hopeless one. The writer believes that we are truly chasing a will-o'-the-wisp in efforts to compare the present with the past, and the less remote past with the more remote

past; but he also believes that, in trained and skillful hands, comparison of disease death-rates will be more and more practicable as the years go on. The ultimate effect of persistent educational propaganda and of letters to physicians will be, it is hoped, the practical elimination of indefinite reports. The careless and incompetent analyst, however, will always be the bull in the mortality statistics china shop.

It is believed that one important lesson to be learned is the necessity for all vital statistics publications to tell frankly in their text comments what rates are not comparable, and to specify the factors which affect their comparability. In all published tables in which death-rates for diseases are given for periods of years, those for which the rates are not comparable should be indicated typographically. This has been done, for some of these titles, in the Census Mortality Reports since 1910.

With the situation as it stands, we should not view with alarm any well considered effort to perfect our classification system, simply because such effort will make our results incomparable with those of past years. As a matter of fact they are incomparable often enough now. If the International List of Causes of Death needs revision in any particular, let it be revised and those of the next generation will thank us. They will thank us because they, at least, may have data that will be truly comparable.

HOUSEKEEPING AND THE PUBLIC HEALTH.

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Presented before the Sociological Section of the American Public Health Association, Washington, D. C., October 20, 1917.

THE world's tragedy has emphasized in a cruelly telling way the importance of saving human effort. In no field today is it more necessary to seek the direct way of accomplishing results and to avoid confusion in aim and method than in public health. It is perhaps not strange that many mistakes have been made in the past. The paper presented last year before the American Public Health Association by Franz Schneider, Jr.,* was a most welcome and timely caution. In discussing "Some Short-Comings of Socio-Sanitary Investigations," Mr. Schneider showed how frequently association has been taken for causation. The first topic he chose for illustration was the effect of housing on health. He gave most illuminating and interesting illustrations of "hasty generalizations dogmatically uttered that are so frequent in reports dealing with social and health conditions." Mr. Schneider performed an invaluable service in thus pointing out that the effects of

* AMERICAN JOURNAL OF PUBLIC HEALTH, January, 1917.

bad housing must be sharply differentiated from the evil results of other conditions if we are not to waste effort or go in the wrong direction in seeking to improve the standard of health. There is a distinct need, as Mr. Schneider says, of standardized terms and methods in making housing inquiries or in planning housing legislation.

My purpose is to urge one special phase of the subject which must be clearly understood if progress is to be made in standardization and if waste of effort is to be prevented. In current studies and investigations of housing there is an almost universal failure to distinguish between housing and housekeeping. In housing exhibitions, for example, one may frequently observe contrasted instances of good and of bad housing in which the difference is solely one of housekeeping, the housing itself being the same in both. Starting with the instance of so-called "bad housing," cleaning the window and letting light in, making up the bed, repairing the stove or chair, removing the clothes from the line strung across the room, clearing away tin cans and broken dishes, and we are given "good housing," although no change has been made in the room itself, and it should be perfectly clear that the methods employed in bringing about the change are not those which would assure good housing, properly speaking.

In regarding the effect of housing on health this distinction must surely be added to those suggested by Dr. Charles J. Hastings.* He asks, "How much of the misery in our back streets is due to one thing and how much to another? How much to worry? How much to dark, dusty factories? How much to improper clothing? How much to improper, insufficient, or badly cooked food? How much to general malnutrition? How much to overcrowding? How much to unsanitary privy pits? How much to drunkenness and dissipation?"

It is possible to interpret housekeeping as covering some of these points as, for example, badly cooked food, but insufficient food must be more frequently attributed to poverty or bad economic conditions. On the other hand, housekeeping covers many other points which are of significance not merely in the spread of infectious diseases but in maintaining the house and the habits of living within it in such a way as to secure the highest degree of vitality and the greatest possible freedom from mental anxiety as well as from bodily and spiritual discomfort. It is indeed in regard to these larger, or it may be said, more general aims that much so-called housing legislation is of value. The usual legal provisions in regard to lighting and overcrowding, for example, can not be shown to have direct results in and of themselves in the lessening of infectious diseases, but their enforcement may contribute toward standards of living which conduce to better health in every respect. On the other hand, there is much of this very legislation which does not in and of itself, even if enforced, secure right conditions. The size of the window,

* Transactions of National Association for the Study and Prevention of Tuberculosis, 1915.

for example, may be stipulated in the ordinance, but that gives no assurance that the room will be either adequately lighted or ventilated. The proximity of another building, heavy draperies, or an accumulation of dirt may keep out the needed light, and on the other hand, the window may never be opened, in which case it may serve to lessen the amount of air renewed even more than an equal area of more pervious wall would do.

Views in regard to the connection between house infection and the spread of tuberculosis are undergoing very radical change. Many of the factors which were formerly supposed to be important, such as sunlight, have proved to be of indirect if of any significance. Virulent bacilli were found by Dr. F. A. Craig, of the Henry Phipps Institute in 66.6 per cent. of the dirty houses which had been occupied by infected persons and in 50 per cent. of the clean houses, a difference, considering the number of houses investigated, not great enough to justify some current theories. In fact, Seymour H. Stone in a "Study of House Infection and the Spread of Tuberculosis,"* makes the following statement as his final conclusion: "We seem to have pretty conclusive evidence that infection by fresh living bacilli through droplets and direct contact is probably the source of a very large proportion of cases, percentages varying from 50 to 95 per cent. If these percentages are correct, is it not further evidence that house infection does not very often occur?" As Dr. E. R. Baldwin of Saranac Lake has said: "House infection is after all another name for contact infection." It is not necessary to give further illustrations of the inadequacy of much existing legislation unless supplemented by proper methods of living and care. It must be constantly borne in mind, of course, that bad living quarters, while seldom the primary cause of ill health, are a factor of importance in the environment of family life. In the words of the Report of the Tuberculosis Survey of the Michigan State Board of Health, "A house is not merely shelter, —it is a form of equipment, a plant with a purpose. All increase in our ideas of the necessity for correct personal and family habits increases the importance of this equipment. It enlarges the functions which the house ought to serve in the life of every family. Insistence on right personal habits will bring the home and its equipment into greater prominence."

My personal conviction is that a community would be better off if it had no housing laws, but each housekeeper maintained a high standard of hygienic housekeeping than if it had the best housing code and admirable enforcement of the laws but at the same time the housekeeper was unintelligent and shiftless. In housing and health conferences, among social workers, health experts, and laymen alike, there is, however, a general tendency to assume that laws in regard to house construction are of so great importance that further measures to secure a healthful environment are frequently neglected. It is, of course, a simple matter to place the whole responsibility upon those who make

* *Journal of the Outdoor Life*, February, 1917.

and administer the law, but it should be urged that more active and cordial support be given by public health officials to all who are trying by precept, example, and education to train housewives to do their share. I would go so far as to suggest that after opportunities for proper training in hygienic housekeeping have been provided, there might well be provision for enforcing the hygienic use of the house and its equipment.

A notable step in the direction of emphasizing the sanitary importance of housekeeping was taken recently in the publication of the little pamphlet entitled "For You," by the Tenement House Department of the City of New York and the Tenement House Committee of the Charity Organization Society, New York City, published in coöperation with the Police Department, Fire Department, Department of Health, Department of Street Cleaning, and Department of Water Supply of the City of New York. Such propaganda in behalf of the proper use of shelter may well be adopted in every community, but it is desirable to have the additional coöperation of school officials, especially teachers, women's clubs, charity organizations, and home economics societies. They would bring to the movement of better living a potential force whose influence and interest are not fully recognized by public health experts and government officials.

In conclusion, I would repeat that housing and housekeeping must be distinguished. Both are factors in the health of the community. Especially in the light of the appeal by this Association to the President of the United States to take measures to conserve the health of the civilian population, efforts should be made to standardize methods in both fields in the light of scientific knowledge and experience. As a practical measure every department of health should have in addition to its sanitary inspectors a staff of competent, well-trained visiting housekeepers who should not only give skilled instruction in hygienic housekeeping but coöperate with other agencies in maintaining decent and wholesome conditions of living.

NOTE. The experience of South End House, Boston, in coöperation with the Women's Municipal League is suggestive. The following statement concerning the experiment is furnished by Miss Gertrude Barrows:

A tenement situated directly opposite South Bay Union, our club house, was taken and furnished with the idea of showing the neighbors what could be done with one of their own houses, if the landlord was made to live up to his part of the agreement. We find that so many of our neighbors are afraid of the landlords that they do not dare to ask for the simplest comforts in the tenements. We persuaded our landlord to whiten the courtyard, according to a board of health regulation in this city, which of course immediately brightened up the rooms, since the tenement was on the first floor. We put no money at all into having the place cleansed and painted, but required him to do it before we moved in. He later became interested, and painted the halls and stairs, which benefited the tenants of the other floors. He also cleaned the cellar, mended the coal bins, and put locks on all four of them, so that the tenants ceased to lose their fuel, as they had in the past.

The tenement was furnished very simply, and all the prices marked plainly on everything

to show what could be done by paying cash instead of buying on the instalment plan. In every room the board of health regulations which could any way apply to that house were posted, and we felt that the neighbors learned a great deal from this, especially since we always had some one at home there in the afternoon to talk over with them the application and relation of our problems and successes with our landlord to their own.

The tenants upstairs became interested, and the people soon asked if they might use the rooms for meetings, which of course gave the tenement a larger influence at once. The whole house took on a different aspect, and one tenant moved because she said she "could not keep up to the pace." This was considered a real fall on her part by the people in her neighborhood, and she has never really been reinstated socially because of it.

The landlord has acquired two other houses, and remodeled them, and he frankly admits that he has been influenced in his ideas by what he learned from having us as tenants.

The tenement was not "given up" in one sense, but after three years was moved on to another part of the city. We felt that it had taught a real lesson here.

THE SPECIFICITY OF DISINFECTANTS AND ITS BEARING ON THEIR STANDARDIZATION.

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Read before the Laboratory Section, American Public Health Association, October 20, 1917, at Washington, D. C.

THE standardization of disinfectants has been an annual subject of discussion before health congresses and societies since the advocation of the "drop method" proposed in 1903 by Rideal and Walker. During these years many refinements, changes and additions have been made to this method, the latest being the control of the acidity of the media by determining the H-ion concentration. There is no doubt that the method has been improved but the question arises has not the broad purpose of the test been overlooked in searching out the details.

There was a time when with limited bacteriological knowledge, it was reasonable to suppose that all disinfectants would bear the same germicidal relation to phenol, no matter on what organism tested. This time has now passed and when a label bears the statement that a certain preparation has a phenol coefficient of 2, it cannot be taken literally, but must be interpreted in the light of the method used in determining this coefficient. If this method is that of the hygienic laboratory, it means that this preparation under the conditions of that test is twice as germicidal as phenol *on the bacillus typhosus, or a particular strain thereof.* No conclusions should be drawn as to its germicidal action on the staphylococcus, streptococcus or any other organism, not excepting the bacillus coli, or paratyphosus. Naturally the closer the chemical relation between the disinfectant and phenol, and the closer the bacteriological relation of the organisms concerned in

the comparison, the more nearly correct will be any conclusion drawn from such a test. On the other hand, it is only rational to suppose that disinfecting agents of widely different character will vary greatly in their germicidal relation to phenol when tested on organisms of different genera or species. Since the advent of synthetic dyes in preparing differential culture media and later the production of diarseno-benzol, the specificity of drugs for certain microörganisms should not be lost sight of. Chick and Martin (1) recognize this specificity of disinfectants when they say, "Some disinfectants are more efficient against a particular organism than against any other." Churchman's (2) work was quite definite in showing the selective affinity of gentian violet for certain organisms. In the main he could divide bacteria into two classes, those which were inhibited in their growth by very weak dilutions of this dye and those which were unaffected by even much stronger solutions. As a rule closely related bacteria reacted similarly to gentian violet but he found a marked exception to this in one strain of B. enteritidis. This strain was indistinguishable by ordinary cultural and staining methods from four other strains of B. enteritidis, yet it was completely inhibited by weak dilutions (1:80,000) of gentian violet, whereas the other four were not. Churchman states that this instance is significant because it establishes the fact that chemical substances may be so specific in their selective affinity for microörganisms as to distinguish among strains of bacteria otherwise indistinguishable; and further that it indicates to what extent our ideas of bactericides must be modified by the conception of chemical affinity, and that the fact that a given bactericide kills a given organism does not justify the conclusion that it will kill all closely related organisms, or even all strains of the same organism.

Browning and Gilmour (3) examined a number of organic and inorganic compounds for their bactericidal action toward different species of bacteria, with a view to discovering—(a) substances possessing specific bactericidal properties for particular organisms and—(b) relationships between chemical constitution and bactericidal action. They found staphylococcus aureus and B. anthracis, organisms more resistant to phenol than is B. typhosus, less resistant than the colityphoid group of organisms to the action of certain basic benzol derivatives among which may be mentioned fuchsin, hexamethyl violet, methyl-green, malachite-green and brilliant green. The amount of hexamethyl violet required to inhibit B. typhosus was 150 times that required for staphylococcus aureus. Furthermore these authors state that whereas the action of malachite green shows no marked difference between its effect on B. typhosus and B. coli, brilliant-green exerts a more marked bactericidal action on B. coli than on B. typhosus. In other words, the bactericidal action of a disinfectant on one organism is not necessarily a measure of its action on another, even when these organisms belong to the same genus or closely related group.

Another very interesting feature of Browning and Gilmour's work is that they found the presence of serum to increase the antiseptic action of flavine for both staphylococcus and B. typhosus. This is certainly contrary to the action of serum on the effect of any other class of disinfectants and should be taken into consideration when giving them a valuation or phenol coefficient.

Flavine is an example of a valuable disinfectant which if gauged by its phenol-coefficient would be practically worthless. Pine oil, on the contrary, is an example of one which, based on its phenol coefficient, should be of considerable importance, but which in practice is deficient in some respects as a general disinfectant. This deficiency was brought to my attention after the issuance of the hygienic laboratory's report (4) on pine oil as an efficient liquid disinfectant when I was asked by a dentist how long a time would be required to sterilize instruments in this Pine Oil Disinfectant. The Pine Oil Disinfectant was made by incorporating 62.5 per cent. of pine oil in soap according to the directions for making the "Hygienic Laboratory Pine Oil Disinfectant." The phenol coefficient of this solution was determined and found to be 3.8. Several different samples of pine oil purchased on the open market varied in their phenol coefficient. This variability of pine oil was mentioned by Hamilton (5) before this association last year.

In testing the ability of this Pine Oil Disinfectant to sterilize dental or other instruments, small steel blades (scarifiers), $\frac{1}{2}$ x $3\frac{1}{2}$ centimeters were contaminated with various organisms and subjected to the action of the dis-

TABLE I.

CULTURES OF STAPHYLOCOCCUS AUREUS—DRIED.

RECENTLY ISOLATED CULTURES.

Time	2% pine oil disinfectant	4% pine oil disinfectant	5% phenol	Water control
5 minutes	+ + +	+ + −	+ − −	+ + +
10 minutes	+ + +	+ + +	− − −	+ + +
15 minutes	+ + +	+ + +	− − −	+ + +
30 minutes	+ + −	+ + +	− − −	+ + −
1 hour	+ + −	+ + −	− − −	+ + +
3 hours	− − −	− − −	− − −	+ + +
20 hours	− − −	− − −	− − −	+ + +

OLD STOCK CULTURES.

5 minutes	+ + +	+ + +	− − +	+ + +
10 minutes	+ + +	+ + +	+ + −	+ + +
15 minutes	+ + +	+ + +	− − +	+ + +
30 minutes	+ + +	+ + +	− − +	+ + +
1 hour	− − +	+ + −	− − −	+ + +
3 hours	− − −	+ + −	− − −	+ + +
20 hours	− − −	− − −	− − −	+ + +

infectant, using phenol as a control, in the following manner:

EXPERIMENT I.

Twenty-four hour broth cultures of recently isolated and old stock cultures of staphylococcus aureus were each used to inoculate 84 metal scarifiers. Both lots were placed in sterile petri-dishes to dry over night.

With sterile distilled water, 2 per cent. and 4 per cent. emulsions of Pine Oil Disinfectant and 5 per cent. solution of phenol were made. Sterile distilled water was used as control. Five per cent. phenol was taken because it is the strength commonly used in sterilizing instruments.

The scarifiers were placed in the above solutions and also in sterile water as a control, 21 in each, and allowed to remain for periods of 5–10–15–30 minutes, 1 hour, 3 hours, and over night. Those placed in the Pine Oil Disinfectant were removed, 3 at the end of each period of time, washed in sterile water and placed in fermentation tubes of broth.

Those in 5 per cent. phenol were removed and washed in 95 per cent. alcohol before placing in fermentation tubes. Those in sterile water were placed directly in fermentation tubes without washing.

After 24 hours' incubation, transplants were made from the fermentation tubes to agar slants. The results are given in Table I in which the plus sign indicates growth of the organisms. The three columns following each interval of time represent the three scarifiers used in each solution.

By the hygienic laboratory method of testing disinfectants, Pine Oil Disinfectant would be classed as having 4 times the germicidal power of phenol.

TABLE II.

CULTURES OF STAPHYLOCOCCUS AUREUS—NOT DRIED.

RECENTLY ISOLATED CULTURES.

Time	2% pine oil disinfectant	4% pine oil disinfectant	5% phenol	Water control
5 minutes	+ + +	+ + +	− − −	+ + +
10 minutes	+ + +	+ + +	− − −	+ + +
15 minutes	+ + +	+ + −	− − −	+ + +
30 minutes	+ + +	+ − −	− − −	+ + +
1 hour	+ + −	+ + −	− − −	+ + −
3 hours	+ − −	− − −	− − −	+ + +
18 hours	− − −	− − −	− − −	+ + +

OLD STOCK CULTURES.

5 minutes	+ + +	+ + +	+ − −	+ + +
10 minutes	+ + +	+ + −	− − −	+ + +
15 minutes	+ + +	+ + −	+ − −	+ + +
30 minutes	+ + +	+ + +	− − −	+ + +
1 hour	+ − −	− − −	− − −	+ + +
3 hours	− − −	− − −	− − −	+ + +
18 hours	− − −	− − −	− − −	+ + +

From the above experiment in which staphylococci were used as test organisms, Pine Oil Disinfectant, 2 per cent. or even 4 per cent. does not destroy the organisms in one hour; whereas they are usually killed by 5 per cent. phenol within 15 minutes. Another striking point brought out in Table I is that Pine Oil Disinfectant, 4 per cent., is no more effective than the 2 per cent. dilution.

In order to check these results a second series was carried out differing from the former only in that the inoculated scarifiers were not dried before placing them in the disinfectant solutions and that the fermentation tubes were incubated 48 hours before transplants were made from them.

These results confirm those of Experiment I, and again show that Pine Oil Disinfectant diluted with water to make a 4 per cent. mixture or emulsion is little, if any, more effective than the 2 per cent. emulsion.

Other similar tests were made using B. typhosus, streptococcus pyogenes, and B. diphtheria and showed that in practically all instances the test organisms were killed within 15 minutes by the disinfectants employed; and that of the four bacteria used in the experiments, the staphylococcus alone stood out as being disproportionately resistant to pine oil solutions in soap.

Pine oil cannot, then, be termed a general disinfectant of high germicidal value, for although showing to advantage when tested on the typhoid bacillus, it is much less efficient than phenol or cresol when the infecting organism is the staphylococcus aureus. This is another instance of the fallacy of the present generally accepted method of determining the value of disinfectants, namely, the so-called hygienic laboratory method. The physician or dentist who does not know the intricacies or inaccuracies of the present methods of testing or standardizing disinfectants is justified in thinking that a phenol coefficient of 4 means that the preparation is four times as active as phenol, and that a 1 or 2 per cent. solution of it will sterilize his instruments within 5 or 10 minutes. He is further justified in reposing confidence in the phenol coefficient of a disinfectant because the method of determining this is sanctioned by the government and by the Council on Pharmacy and Chemistry of the American Medical Association. One state requires that disinfectants must have the phenol coefficient on the label, and before a disinfectant will be admitted to New and Non-Official Remedies, this same condition must be complied with. Defects of this method have been repeatedly pointed out, but have been apparently disregarded by its advocates and entirely overlooked by others interested in having it made a legal method for standardizing disinfectants. Hamilton and Ohno (6) have shown that this method in different hands gives widely varying results when testing the same disinfectant on the same strain of typhoid organism. If comparable results cannot be obtained when the same organism is used, one would certainly expect a disinfectant to vary widely in germicidal power when tested on different organisms. In fact, Anderson and McClintic, the

originators of the Hygienic Laboratory Method, say (7) "Unless different observers use the same species of organism, there can be no possibility of uniformity in results. The coefficient obtained with different species may vary as much as 300 per cent." If this be the case, what is the practical value of the phenol coefficient as determined by the Hygienic Laboratory Method? Certainly only a small proportion of any commercial disinfectant is employed to destroy typhoid bacilli.

In the case of pine oil, we have an agent considerably more germicidal than phenol when acting on the typhoid bacillus, and very much less active then phenol on the staphylococcus. This proves conclusively that the comparative disinfectant value of pine oil and phenol cannot be determined by any one test.

Other defects in the Hygienic Laboratory Method have been pointed out. Duyser and Lewis (8) call attention to three factors which cause unreliable results. As stated they are "(a) The use of an excessive number of bacteria depletes the disinfecting solution before the culture is rendered sterile. (b) An unknown volume is withdrawn for testing, in that the volume of the standard loop is not constant. (c) It is impossible to determine from the broth tube inoculated, how complete the killing was at the time the sample was withdrawn." Duyser and Lewis showed that the so-called standard loop, which is supposed to transfer a constant amount of culture from a tube or flask to the disinfectant, varies under the best conditions at least 30 per cent. from the average, and when not very carefully used may vary as much as 80 per cent. This inaccuracy of the standard loop was verified by A. D. St. John (9) who was able to obtain with the same loop a variation of 300 per cent. by slowly withdrawing the loop edgewise and quickly withdrawing it parallel with the surface. The lack of uniformity of different loops in the hands of different bacteriologists can readily be appreciated.

So that, as a matter of fact, the stating of the phenol coefficient on a label may be misleading and, instead of informing the public as to the value of any particular agent, may misinform and give a false sense of security. At the same time it would afford ample opportunity for litigation and a wide difference of opinion among experts.

The value of any method of testing disinfectants has been well stated by Phelps (10), "The results of any disinfection experiments are fundamentally influenced by such conditions as temperature, character of the organism employed, number of organisms in unit volume, and character of the medium. In the absence of complete data covering these points results are practically worthless, at least for purposes of comparison. Even with such data given, it is still impossible owing to the variable conditions obtaining in practice, to establish any relationship, or order of excellence, among the various disinfectants. At best we can only hope to establish such relationship under specified experimental conditions." He further says "It seems at present to be quite

necessary to determine the relative germicidal values of two disinfectants upon the actual kind of germ upon which they are to be employed and to qualify the final comparative results accordingly." In no case has the practical value of this dictum been so clearly exemplified as in the present investigation. Based on the report of Stevenson from the Hygienic Laboratory entitled "An Efficient Liquid Disinfectant," one would be led to think that "Pine Oil Disinfectant" is 4 to 6 times as effective a germicide as phenol, without any exceptions. That this is not the case has been clearly shown by the preceding experiments and contrary to the statement in the above report, Pine Oil Disinfectant cannot be satisfactorily used to replace the ordinary coal tar compounds commonly employed as disinfectants.

There is another phase of the question brought up by these discrepancies, namely, legalizing the Hygienic Laboratory Method as a standard method under which prosecutions may take place. That this is not desirable is readily understood when the inaccuracy of the method is considered. Almost every factor concerned is variable and is difficult or impossible to control. The temperature, the media, the number of bacteria used, the change in resistance of the organisms, and the technique are some of these factors already mentioned. These have been well discussed in the paper of J. T. Ainslee Walker (11).

Aside from these considerations, the true value of a disinfectant can only be stated in terms of the organism or organisms on which it is to be used in actual practice. To state that Pine Oil Disinfectant is "an efficient liquid disinfectant" which "may be used wherever the ordinary coal tar compounds are used" is certainly drawing erroneous conclusions from a phenol coefficient determination.

The paradoxical action of pine oil in being markedly more germicidal than phenol on the typhoid bacillus and decidedly less germicidal on the staphylococcus is an interesting phenomenon deserving further study and is apparently illustrative of specificity in disinfectants.

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THE PATENT MEDICINE SITUATION.

JOHN PHILLIPS STREET,

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Read before the Food and Drugs Section, October 19, 1917, at Washington, D. C.

TO ANY student of the patent medicine problem two events stand out most distinctly as marking turning points in the history of remedial legislation as applied to this disreputable business, namely, the passage of the Federal Food and Drugs Act and the subsequent amendment to that act known as the Sherley Amendment.

The federal law requires a statement on the label of the presence and amount of certain specified habit-forming drugs, and the Sherley Amendment insists that all statements on the label, on the carton or in the literature accompanying the remedy shall be therapeutically correct.

The notification by the label to the purchaser that his favorite remedy contained one or more habit-forming drugs has distinctly discouraged the use of such remedies. This has been particularly true with reference to alcohol. For many years certain of our well-known nostrums, the bitters, the tonics, the sarsaparillas, the "spring medicines," have enjoyed a wide popularity in homes where any thought of hard liquor or booze was taboo. When the government required the labels of these medicines to show that alcoholically they were close kin of whisky, rum or gin, their popularity speedily waned, and today many of them are sold either with their alcohol content reduced or entirely eliminated, or their names have been changed; in some cases their manufacture has ceased altogether. Old Doctor Hartmann first reduced the alcohol in his Peruna from 28 to 17 per cent., then to dodge the excise tax he added some senna and cubeb, and finally, apparently in despair, abandoned the name which had become almost a household word, and gave his nostrum the new name Katarno, in order to bolster up its fast-lagging sales. The bar over which Lydia E. Pinkham still continues to smile so benignantly, while not yet a temperance bar, now requires three drinks of the Vegetable Compound to secure the equivalent of a drink of whisky instead of two as in the good old days. You can no longer get drunk on Ayres' Sarsaparilla, as instead of its former 16 per cent. of alcohol today it contains none at all.

The same condition is found with the more dangerous habit-forming drugs, such as morphin, opium, heroin, cocain, etc. Even before the passage of the Harrison Act, the use of drugs of this character in patent medicines was constantly on the decrease. The average sufferer, unless he were a drug habitué, generally took alarm at the names of these familiar poisons on his

medicine bottle, and feared to use the medicine. Accordingly we find many revised formulas for these remedies. The manufacturer does not dare withhold the required information and in many cases has substituted other drugs to allay the public distrust. The patient failing to obtain the customary effect of the active and dangerous drug discontinues the use of the medicine, so that we find certain of the most widely advertised of these nostrums gradually being withdrawn from public sale. The soothing syrups, the "baby-killers," are almost a matter of history today rather than a crying evil. Mrs. Winslow's familiar brand illustrates this point. In 1908 it contained 0.4 grains of morphin per fluid ounce; in 1911 0.16 grain of morphin sulphate per fluid ounce; in 1912 in Great Britain it contained potassium bromid and senna, but no alkaloids; in 1915 Indiana reported it as an anise, caraway and coriander syrup; while today the manufacturer claims senna, rhubarb, sodium citrate, sodium bicarbonate, anise, fennel, caraway, coriander, glycerin and sugar syrup.

The passage of the Sherley Amendment greatly strengthened the Federal Food and Drugs Act. Under a somewhat forced interpretation of the original law the United States Supreme Court held that so long as the manufacturer made no false statements on the label concerning the ingredients of the nostrum, he could not be held guilty of misbranding no matter what curative powers he attributed to it. The Sherley Amendment corrected this alleged weakness in the act, and permits no false statement as to the therapeutic effect of the medicine either on the label, on the carton or in the printed matter which accompanies the remedy. Since the passage of the amendment patent medicine literature has undergone a great transformation. To be sure the millennium has not yet arrived, but the statements as to curative powers are now made in carefully guarded phrases, or are absent altogether. The manufacturers of many of these remedies, apparently under the tutelage of astute legal talent or of commercialized physicians or chemists, have revised their labels and their literature so that they will not run foul of the provisions of this amendment.

The literature of Eckman's Alterative, formerly a consumption "cure," now uses the following guarded language:

"After these changes occur and the system comes under the influence of the alterative, a gradual improvement *should* follow; the appetite *generally* increases, nausea, vomiting and indigestion *usually* cease; expectoration is *facilitated* and the sputum becomes a lighter yellow, thinner and *sometimes* frothy; the severity of the coughing spells *is expected to lessen;* fever *should lessen* and sleep become more restful; chest pains and night sweats *usually* subside. *Generally*, as repair progresses, toxemic symptoms—anaemia, weakness, emaciation, etc.—are remedied and the mental condition *often* changes to one of interest and contentment." (Italics mine.)

Fulton's Renal Compound makes this guarded statement:

"It is to be impressed on patients that what nature does slowly she undoes slowly and that in chronic cases very little is to be expected from the first three or four bottles; in fact, it commonly takes from four to six to begin to make a showing, and it often takes dozens to effect a cure."

Pierce's Anuric Tablets state "it is not to be expected that these tablets are a cure for all serious kidney diseases, when present in chronic form."

Kilmer's Swamp Root says "We do not wish to have anyone take Swamp Root who does not need it, but if people take it who need it, the remedy will do the rest and thus fulfill its great mission."

The net result of these two legislative acts has been a great improvement in the nostrum situation. Nevertheless any one who has made a study of the subject speedily realizes that neither the Food and Drugs Act nor the Sherley Amendment goes quite far enough. It is indeed a great benefit that the user of a nostrum should know whether or not the alleged remedy contains alcohol, morphin, opium, cocain, heroin, chloroform, cannabis indica, chloral hydrate or acetanilid. But why should the declaration of ingredients be limited to these few habit-forming drugs? Is it not almost as important that the consumer should be warned of the presence of bromids, arsenic, ammoniated mercury, corrosive sublimate, lead acetate, pyramidon, santonin, wood alcohol, paraphenylene diamine, strychnin, fusel oil, or other dangerous drugs, especially in light of the fact that so frequently nostrums containing these drugs are labeled "perfectly harmless." In my recent work with patent medicines I have found 6 to contain wood alcohol, 3 ammoniated mercury, 3 bromids, 6 corrosive sublimate, 7 lead acetate, 2 silver nitrate, and one each fusel oil, paraphenylene diamine, pyramidon and pyrogallol. This list includes remedies widely advertised, and presumably widely used, and it would seem that the consumer was entitled to protection against them.

Similarly, the Sherley Amendment while effecting a great improvement in the honesty of the statements of the bottle, the carton and the accompanying leaflet, its provisions in no way affect any statements which the manufacturer may care to make through the advertising columns of the newspaper or the magazine. I have no way in which to prove the statement, but for a long time I have felt that the average consumer of these nostrums pays but little attention to the label of the bottle and even less to the literature that comes with it. Neither the reading of the label nor the studying of the medical treatise which the manufacturer so generously supplies has been the impelling cause which has led to the purchase of the remedy. The flaring newspaper advertisement, or the tawdry window display of the druggist, with possibly a few 65 feet tapeworms on the side, are what have brought the medicine to his attention. Until the advertising columns of our newspapers, our weeklies and our monthlies are thoroughly cleaned up, the solution of the nostrum evil is still far distant.

In the speaker's judgment the most

medicine bottle, and feared to use the medicine. Accordingly we find many revised formulas for these remedies. The manufacturer does not dare withhold the required information and in many cases has substituted other drugs to allay the public distrust. The patient failing to obtain the customary effect of the active and dangerous drug discontinues the use of the medicine, so that we find certain of the most widely advertised of these nostrums gradually being withdrawn from public sale. The soothing syrups, the "baby-killers," are almost a matter of history today rather than a crying evil. Mrs. Winslow's familiar brand illustrates this point. In 1908 it contained 0.4 grains of morphin per fluid ounce; in 1911 0.16 grain of morphin sulphate per fluid ounce; in 1912 in Great Britain it contained potassium bromid and senna, but no alkaloids; in 1915 Indiana reported it as an anise, caraway and coriander syrup; while today the manufacturer claims senna, rhubarb, sodium citrate, sodium bicarbonate, anise, fennel, caraway, coriander, glycerin and sugar syrup.

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Pierce's Anuric Tablets state "it is not to be expected that these tablets are a cure for all serious kidney diseases, when present in chronic form."

Kilmer's Swamp Root says "We do not wish to have anyone take Swamp Root who does not need it, but if people take it who need it, the remedy will do the rest and thus fulfill its great mission."

The net result of these two legislative acts has been a great improvement in the nostrum situation. Nevertheless any one who has made a study of the subject speedily realizes that neither the Food and Drugs Act nor the Sherley Amendment goes quite far enough. It is indeed a great benefit that the user of a nostrum should know whether or not the alleged remedy contains alcohol, morphin, opium, cocain, heroin, chloroform, cannabis indica, chloral hydrate or acetanilid. But why should the declaration of ingredients be limited to these few habit-forming drugs? Is it not almost as important that the consumer should be warned of the presence of bromids, arsenic, ammoniated mercury, corrosive sublimate, lead acetate, pyramidon, santonin, wood alcohol, paraphenylene diamine, strychnin, fusel oil, or other dangerous drugs, especially in light of the fact that so frequently nostrums containing these drugs are labeled "perfectly harmless." In my recent work with patent medicines I have found 6 to contain wood alcohol, 3 ammoniated mercury, 3 bromids, 6 corrosive sublimate, 7 lead acetate, 2 silver nitrate, and one each fusel oil, paraphenylene diamine, pyramidon and pyrogallol. This list includes remedies widely advertised, and presumably widely used, and it would seem that the consumer was entitled to protection against them.

Similarly, the Sherley Amendment while effecting a great improvement in the honesty of the statements of the bottle, the carton and the accompanying leaflet, its provisions in no way affect any statements which the manufacturer may care to make through the advertising columns of the newspaper or the magazine. I have no way in which to prove the statement, but for a long time I have felt that the average consumer of these nostrums pays but little attention to the label of the bottle and even less to the literature that comes with it. Neither the reading of the label nor the studying of the medical treatise which the manufacturer so generously supplies has been the impelling cause which has led to the purchase of the remedy. The flaring newspaper advertisement, or the tawdry window display of the druggist, with possibly a few 65 feet tapeworms on the side, are what have brought the medicine to his attention. Until the advertising columns of our newspapers, our weeklies and our monthlies are thoroughly cleaned up, the solution of the nostrum evil is still far distant.

In the speaker's judgment the most

promising avenue for reform at the present time lies in a quickening of the managerial conscience as to the quality of medical wares he will allow to be advertised with his sanction to his readers. It is indeed a hopeful sign to find that the great advertising associations are beginning to recognize the evil of fraudulent medical advertising and simply as a matter of self-preservation are endeavoring to clean their own Augean stables. The American Pharmaceutical Association and the National Vigilance Committee of the Associated Advertising Clubs of the World both have drawn up regulations concerning medical advertising, which if faithfully followed out will serve as a great protection to the ignorant consumer.

The speaker believes that self-medication is a dangerous pastime, but as long as human nature endures it will be impossible to repress completely man's desire to tinker with his insides. It is quite possible that there is a legitimate field for the advertising of ready-made remedies for the home treatment of common ailments, but granting this possibility certain restrictions are obviously necessary. The National Viligance Committee has drawn up the following eleven requirements, which I think are worthy of our attention for a moment, and which are suggestive as to the steps advertisers themselves are taking to check the evil. In brief these requirements are as follows:

1. The medicine must be appropriate for the particular affection for which it is recommended and must not affect unfavorably the course of the disease.

2. The remedy must not be named or advertised in a way to conceal its proprietary character.

3. The remedy should be offered through the regular wholesale or retail channels of trade, and not directly to the purchaser from the manufacturer.

4. If the preparation contains alcohol, it must be sufficiently medicated to prevent its use as an alcoholic beverage, and the proportion of alcohol should be no greater than that needed to hold permanently in solution the essential active ingredients of the preparation.

5. If the preparation is one which may be taken internally it must not contain cocain, nor opium or any of its alkaloids, in greater proportion than those specified in the Harrison Act.

6. No children's remedy shall contain cocain, or opium or its alkaloids, or their derivatives, in any proportion whatever.

7. If the preparation is one which may occasion injury through misuse, proper warning against such use must be given on the label.

8. The preparation must not be intended for use as an abortifacient nor for any other immoral or illegal purpose, nor must it be advertised directly or indirectly for such a purpose.

9. The preparation must not be advertised or recommended, directly or by inference, as a cure for the diseases or conditions generally recognized as incurable by the simple administration of drugs, or for the cure of contagious diseases or those sufficiently acute to require skilled treatment.

10. The preparation must be in strict conformance with the Sherley Amendment.

11. Advertising not accompanying the package shall conform substantially to the statements on the label, carton or accompanying circular as to origin, composition, character and curative value.

The above outline in my judgment offers a basis for valuable constructive work. Certain cities, such as New York, Washington and Cleveland, have made more or less successful efforts to check the nostrum evil, and it would seem that the propaganda against the abuse and misuse of these remedies should form part of the program of every well-organized health department.

The responsibility for the wide use of these nostrums of course rests in a large measure on their makers, but even the most misguided manufacturer would not continue to make what he could not sell. The physician, the newspaper, the druggist and the consumer must share the responsibility for this menace to the health of our people. Some physicians make patent medicines, some testify for a consideration as to their worth, some actually prescribe them, in spite of the fact that in many cases they must be uncertain as to the composition of the medicines they are prescribing; the responsibility of such physicians is great. The newspapers must likewise bear much of the responsibility as they for mere dollars continue to allow their advertising columns to be used for the exploitation of remedies whose worthlessness, fraudulence and dangerous character have been exposed over and over again; they give the nostrum maker his chief stock in trade, publicity, and totally disregard their obligation to supply their readers with honest advertisements as well as accurate news. The druggist, both wholesaler and retailer, as the purveyor of these wares, is equally responsible. In spite of the frequent claim made by him that he would prefer not to handle proprietaries, we find that his advertisements generally lay stress not on his ability to compound accurate and reliable prescriptions but that he sells patent nostrums at cut-price rates. Not only does he sell these proprietaries, but with hardly an exception each druggist makes his own little line of "just-as-good," or "just-as-bad," preparations, thereby putting himself on the same basis as the general manufacturer. The mere fact that a group of 10,000 or 25,000 or 100,000 druggists makes a line of preparations widely acclaimed as "not patent medicines" in no wise removes them from the category of the nostrum makers. Furthermore certain druggists in order to gain a little free advertising are willing to allow their names to be used in the exploitation of remedies which from their very experience and training they must know to be fraudulent. Tanlac, Lax-A-Tone, Quaker Herb Extract, Fruitatives, are examples of medicines which have been recently exploited in my town under the guidance of our local druggists, and I presume this condition is quite universal. The great manufacturing drug houses, presumably organized

on high ethical planes, directly cater to the nostrum trade. In a recent visit to the factory of one of the leading firms of this character, I noticed cartons for Limestone Phosphate, Wyeth's Sage and Sulphur and Sargol, all notorious fakes.

And lastly, the consumer. His responsibility is indeed great and he is the main sufferer. He has been encouraged to indulge in that dangerous luxury "self-medication"; sometimes he has felt benefited, in his ignorance confusing stimulation or deadened pain with cure. It will take a long time to reform the manufacturer, the physician, the newspaper, and the druggist, but the consumer can reform himself. He can refuse to buy this stuff and by his example encourage others to imitate him.

A SIMPLE MEDIUM FOR THE DIFFERENTIATION OF MEMBERS OF THE TYPHOID-PARATYPHOID GROUP.

I. J. KLIGLER,

Department of Public Health, American Museum of Natural History, New York.

Read before the Laboratory Section at Cincinnati, Ohio, October 25, 1916.

RAPID differentiation of closely related organisms by a simple cultural test is not always possible. Serological tests are often helpful, but with the intermediate members of the colon-typhoid bacilli even this method is not always reliable. Moreover not every laboratory has the necessary sera on hand. Typhoid and paratyphoid bacilli can be distinguished from one another by their fermentation of glucose, the former producing acid and no gas while the latter produce both gas and acid. This reaction is sufficiently constant to be depended upon though aberrant strains are occasionally encountered. However, no satisfactory cultural test for the differentiation of the paratyphoid bacilli has been reported until recently.

In 1905 Sacquépée and Chevrel (1) found that, under a given set of conditions, paratyphi A and B and B. typhi can be differentiated by means of lead acetate. The authors were of the opinion, however, that the reaction was not constant unless exact experimental conditions were duplicated. Probably, as a result of this conclusion, no one attempted to confirm their findings.

Recently Burnet and Weissenbach (2) (1915) reported the results of an extensive comparative study of the agglutinations and lead acetate reactions of five hundred and seventeen strains of B. typhi, B. paratyphi A and B. From their study they concluded that the lead acetate medium can be used for the differentiation of these types. On testing this medium with eighty-five strains of colon, typhoid and intermediate forms it proved to be highly satisfactory for the separation of B. typhi and B. paratyphi B from B. paratyphi A, but the first two could not be distinguished from one another.

It seemed probable that, if this medium could be so modified as to combine gas production from glucose with the lead acetate reaction, a simple method would be at hand for the rapid differentiation of these bacilli on the basis of two important biochemical properties.

Neither of the authors mentioned say anything about the nature of the lead ace-

tate reaction. At first thought one would expect it to be a reaction between the H_2S liberated and the lead. If that were so sugar, exerting a sparing effect on the utilization of peptone, should inhibit or completely interfere with the reaction. This was found not to be the case. The experiments indicated that the reaction involved is probably a reduction of the lead acetate to lead oxide (PbO_2) which is brown. It was noted, however, that an excess of sugar did interfere with the lead acetate reaction, while an excess of lead inhibited growth.

The following medium finally proved satisfactory:

(1) Meat infusion agar containing ¾ per cent. or 1 per cent. agar (depending on the moisture content of the agar shreds).

(2) 0.1 per cent. glucose.

(3) 0.05 per cent. lead acetate.

The optimum reaction is P H 7.2–7.6.

The agar is prepared in the usual way, except that ¾ per cent. or 1.0 per cent agar is used instead of the usual 1.5 per cent. This gives a semi-solid medium which has several advantages. Gas production is readily observed by the diffusion of bubbles and the breaking up of the medium. Moreover the softness of the medium permits the motile organisms to grow away from the line of inoculation, giving the growth a brush-like appearance which can be used as an additional differential test.

The sugar and lead are dissolved in water separately, sterilized and added sterily to the agar. It is necessary to cool the agar to about 60° C. before adding the lead and to rotate the tube to obtain uniform distribution. This gives a clear transparent medium. If this precaution is not taken, the lead floculates the peptone and before the tube cools most of the precipitate settles to the bottom of the tube. As a precautionary step the tubes should now be incubated to insure sterility.

Stab inoculations either from fresh plate colonies or broth cultures are made with a platinum wire and the tubes incubated for eighteen to twenty-four hours. Strains of B. typhi brown the medium along the line of growth; B. paratyphi B produces browning and also gas; B. *paratyphi A* causes no browning but produces gas; and, finally, B. *dysenteriæ* produces neither browning nor gas.

Altogether eighty-five strains, representing all the various species included in the colon-typhoid family, were tested. The number of cultures of each type studied and their reactions are summarized in Table I. Two sharply defined groups are obtained according to whether the organisms brown the medium or not. In one group are included the typhoid, para-

TABLE I.

CHARACTERISTIC DIFFERENTIAL REACTIONS OF TYPHOID, PARATYPHOID AND DYSENTERY BACILLI.

Name of organism	No. of strains	Per cent. browning medium	Per cent. showing gas
B. typhi	22	100*	000
B. paratyphi B.	5	100	100
B. enteritides	4	100	100
B. murium	3	100	100
Danysz	3	100	100
Icteroides	1	100	100
Total	38		
B. paratyphi A	10	0.00	100
B. cholera suis	5	0.00	100
B. voldagsen	1	0.00	100
B. abortivus	3	0.00	100
B. from horse (paratyphoid)	1	0.00	100
B. dysenteriæ	7	0.00	000
B. pullorum	3	0.00	000
	30		
B. alcaligenes	1	0.00	000
coli bacilli	17	6.0	100

NOTE: It is interesting to note that with the exception of B. murium all the animal pathogens group themselves under B. paratyphi A.

*B. typhi does not as a rule produce as much browning as the B. *paratyphi B*.

typhoid B. enteritidis and the dangysz rat virus bacilli. B. icteroides, once thought to be the cause of yellow fever, falls in this group. In the second group are included the B. paratyphi A, the B. suipestifer, swine typhoid, B. abortivus and dysentery, pullorum and alcaligenes; also all the strains but one of col. aerogenes and cloacæ examined. Each of these two groups can readily be subdivided in the same medium into subgroups based on the gas production. Thus in group one gas production divides the typhoid from the paratyphoid B. enteritidis and murium bacilli. Group two is split into the paratyphi A, cholera suis, etc., and the dysentery and pullorum bacilli.* Another differentiating character which distinguishes the subgroups of group two is the diffusibility through the set medium of the motile organisms. The paratyphi and suipestifer, being motile, form a thin growth in the line of inoculation, the dysentery and pullorum, on the other hand, show a sharply defined mass of growth along the line of inoculation. The latter character may also serve to distinguish dysentery and pullorum bacilli from B. typhi.

We have, thus, in a single tube, a simple medium which enables us to differentiate the organisms grown on the basis of three distinctive characteristics: motility, acid-polysaccharide fermentation and gas production. From the observations of the French authors and my own results there appears to exist a degree of constancy which renders the test specific for absolutely reliable. Most of our strains have been tested at least half a dozen times during a period of three to four months without any variation in the results. The constancy of the gas production is so generally accepted that it requires no comment. The motility test is not as certain as the others, but it serves as a confirmatory distinctive character for the separation of the pullorum and dysentery bacilli from all the others. In addition to combining three tests the medium is easily prepared, the ingredients inexpensive and readily obtainable.

This medium obviously does not differentiate the organisms intimately related with paratyphi B. (B. enteritidis, B. murium) or those closely resembling B. paratyphi A (B. suipestifer, abortivus, voldagsen) from each other. But in this respect it does not differ from any other medium proposed heretofore. It rather tends to emphasize the close relationship between the members of these two large groups and, from what we know about these organisms, it is reasonable to consider the members of each group as subspecies or varieties of the main types. These two types—B. paratyphi A and B. paratyphi B—can be readily distinguished from one another by the aid of this medium.

Since the paper was given to press I have found that this medium may be successfully combined with the Russell double sugar tube. (0.5 per cent. lactose and actate added, as directed above, to the double sugar medium) and for this latter use the inoculation made as directed by Dr. Russell. Ammonia collects in the closed arm of the tube and the motile organisms can be readily distinguished from the non-motile.

References.

1. Sacquépée, E.: Ann. de l'Inst. Pasteur, 1905, xix, 33.
2. Russell, H. L., and Weinzirl, J.: Univ. Wisconsin Agric. Exper. Sta. Research Bull., 1909, vii, 1.
3. Rosenau, M. J.: Preventive Medicine and Hygiene, New York, 1913, 316.

* Ann. Rep. Dept. Health, New York City, 1913, ii, 317.

ABSTRACT OF MINUTES OF THE FORTY-FIFTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION HELD AT WASHINGTON, D. C., OCTOBER 17–20, 1917.

FIRST GENERAL SESSION, OCTOBER 18, 1917, 11.30 A. M., NEW WILLARD HOTEL.

Called to order by President W. A. Evans.

The following Committee on Resolutions was appointed: Dr. Haven Emerson (Chairman), Dr. Chas. J. Hastings, Dr. Oscar Dowling, Dr. T. D. Tuttle, Dr. R. Guiteras, Dr. M. S. Iglesias.

The following Committee on Deceased Members was appointed: Dr. Peter H. Bryce, Chairman, Dr. John A. Vogelson, Dr. J. W. Trask, Dr. P. S. Schenk and Dr. J. D. Robertson.

Dr. W. A. Evans then read his presidential address.

The members next grouped themselves for election of representatives to the Advisory Council.

SECOND GENERAL SESSION, OCTOBER 18, 1917, 7.45 P. M., NEW NATIONAL MUSEUM.

Called to order by President Evans.

The following resolutions presented by the Committee on Resolutions were adopted by the Association:

RESOLUTION

Resolved, That the American Public Health Association present the following memorandum to the President of the United States, expressing the conviction of its members that the present circumstances demand, and the time is now ripe for a concerted effort to protect and conserve the health of the civil population. And be it resolved further that the President of the American Public Health Association be authorized to appoint a committee to carry this resolution and memorandum to the President of the United States.

MEMORANDUM.

We recognize the success of the President in his development of a broad program, conserving the industrial efforts and economic resources of the country, and concentrating them upon the prosecution of this war for our continued existence in freedom. The experience of countries longer in war than ourselves has demonstrated the equal necessity of organizing the national resources for the conservation of human life and the maintenance of the health and energy of the civil population, which under an increased stress to support the military activities of the nation, is now subjected to unusual disturbance of social and economic equilibrium, leading inevitably to an increase of disease, disability and premature mortality. At this very time, when our people at home are in greater need than usual of medical and surgical care and of community health protection, we find large numbers of physicians and sanitarians necessarily withdrawn for military service, with the result that large areas and considerable groups of population are left inadequately provided for.

We, therefore, beseech your interest in such development of the Public Health Service as will provide a national program for the coördination and direction of the efforts of all local, state, and national health agencies along the most effective lines, and will bring home to the whole country the importance of health protection, and to each individual the rôle he must play in order to maintain his own health and that of the community.

We make this petition in the confident belief that the universal spirit of service and coöperation, which now prevails throughout the country, guarantees to such a program of education and protection, a success never before attainable in the conservation of our greatest asset—the nation's health.

To the end that such a program of health administration may be put into effective operation, and the emergencies and opportunities of the time be met in a way commensurate with the federal responsibilities, we believe that a generous appropriation should be made available for the Public Health Service.

typhoid B, enteritidis and the danysz rat virus bacilli. B. icteroides, once thought to be the cause of yellow fever, falls in this group. In the second group are included the B. paratyphi A, the B. suipestifer, swine typhoid, B. abortivus and dysentery, pullorum and alcaligenes; also all the strains but one of coli, ærogenes and cloacæ examined. Each of these two groups can readily be subdivided in the same medium into subgroups based on the gas production. Thus in group one gas production divides the typhoid from the paratyphoid B, enteritidis and murium bacilli. Group two is split into the paratyphi A, cholera suis, etc., and the dysentery and pullorum bacilli.* Another differentiating character which distinguishes the subgroups of group two is the diffusibility through the soft medium of the motile organisms. The paratyphi and suipestifer, being motile, form a halo around the line of inoculation, the dysenteria and pullorum, on the other hand, show a sharply defined pencil of growth along the line of inoculation. This latter character may also serve to distinguish dysentery and pullorum bacilli from B. typhi.

We have, thus, in a single tube a simple medium which enables us to differentiate the organisms grown on the basis of three distinctive characteristics: motility, carbohydrate fermentation and lead acetate reduction. From the observations of the French authors and my own results there appears to exist a degree of constancy which renders the lead acetate test absolutely reliable. Most of our strains have been tested at least half a dozen times during a period of three to four months without any variations in the results. The constancy of the gas productions is so generally accepted that it requires no comment. The motility test is not as certain as the others but it serves as a confirmatory distinctive character for the separation of the pullorum and dysentery bacilli from all the others. In addition to combining three tests the medium is easily prepared, the ingredient inexpensive and readily obtainable.

This medium obviously does not differentiate the organisms intimately related with paratyphi B. (B. enteritidis, B. murium) or those closely resembling B. paratyphi A (B. suipestifer, abortivus, voldagsen) from each other. But in this respect it does not differ from any other medium proposed heretofore. It rather tends to emphasize the close relationship between the members of these two large groups and, from what we know about these organisms, it is reasonable to consider the members of each group as subspecies or varieties of the main types. These two types—B. paratyphi A and B. paratyphi B—can be readily distinguished from one another by the aid of this medium.

Since this paper has gone to press, I have found that this medium may be successfully combined with the Russell* double sugar tube. 0.05 per cent. basic lead acetate is added, as directed above, to the double sugar medium and the tube slanted and the inoculation made as directed by Dr. Russell. Andrade's indicator (1 cc. to 100 cc. of agar) must be used in place of litmus. The results were identical with those recorded above. The indicator does somewhat obscure the reaction of the typhoid but not that of the paratyphoid bacilli. Care must be taken to use lactose free from glucose, since an excess of glucose vitiates the efficacy of the medium. The advantages of this modification are obvious.

References.

1. Sacquépée et Chevrel, *1905*. Compte reudus de la Soc. de Biol., p. 535.

2. Burnet, E., and Weissenbach, R., *1915*. Compte reudus de la Soc. de Biol., *78*, 565.

Received for publication, October 1, 1916.

*B. pullorum is a slow gas producer and usually does not produce sufficient gas to break up the medium. It is, however, of little significance since it is not pathogenic for humans.

*Jour. Med. Res., 1911, *25*, 217.

ABSTRACT OF MINUTES OF THE FORTY-FIFTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION HELD AT WASHINGTON, D. C., OCTOBER 17–20, 1917.

FIRST GENERAL SESSION, OCTOBER 18, 1917, 11.30 A. M., NEW WILLARD HOTEL.

Called to order by President W. A. Evans.

The following Committee on Resolutions was appointed: Dr. Haven Emerson (Chairman), Dr. Chas. J. Hastings, Dr. Oscar Dowling, Dr. T. D. Tuttle, Dr. R. Guiteras, Dr. M. S. Iglesias.

The following Committee on Deceased Members was appointed: Dr. Peter H. Bryce, Chairman, Dr. John A. Vogelson, Dr. J. W. Trask, Dr. P. S. Schenk and Dr. J. D. Robertson.

Dr. W. A. Evans then read his presidential address.

The members next grouped themselves for election of representatives to the Advisory Council.

SECOND GENERAL SESSION, OCTOBER 18, 1917, 7.45 P. M., NEW NATIONAL MUSEUM.

Called to order by President Evans.

The following resolutions presented by the Committee on Resolutions were adopted by the Association:

RESOLUTION

Resolved, That the American Public Health Association present the following memorandum to the President of the United States, expressing the conviction of its members that the present circumstances demand, and the time is now ripe for a concerted effort to protect and conserve the health of the civil population. And be it resolved further that the President of the American Public Health Association be authorized to appoint a committee to carry this resolution and memorandum to the President of the United States.

MEMORANDUM.

We recognize the success of the President in his development of a broad program, conserving the industrial efforts and economic resources of the country, and concentrating them upon the prosecution of this war for our continued existence in freedom. The experience of countries longer in war than ourselves has demonstrated the equal necessity of organizing the national resources for the conservation of human life and the maintenance of the health and energy of the civil population, which under an increased stress to support the military activities of the nation, is now subjected to unusual disturbance of social and economic equilibrium, leading inevitably to an increase of disease, disability and premature mortality. At this very time, when our people at home are in greater need than usual of medical and surgical care and of community health protection, we find large numbers of physicians and sanitarians necessarily withdrawn for military service, with the result that large areas and considerable groups of population are left inadequately provided for.

We, therefore, beseech your interest in such development of the Public Health Service as will provide a national program for the coördination and direction of the efforts of all local, state, and national health agencies along the most effective lines, and will bring home to the whole country the importance of health protection, and to each individual the rôle he must play in order to maintain his own health and that of the community.

We make this petition in the confident belief that the universal spirit of service and coöperation, which now prevails throughout the country, guarantees to such a program of education and protection, a success never before attainable in the conservation of our greatest asset—the nation's health.

To the end that such a program of health administration may be put into effective operation, and the emergencies and opportunities of the time be met in a way commensurate with the federal responsibilities, we believe that a generous appropriation should be made available for the Public Health Service.

RESOLUTION

Resolved, That the American Public Health Association urges upon all federal, state and local health authorities; upon physicians, hygienists and sanitarians; and upon all organizations interested in or dealing with the public health, the importance of unusual solicitude and activity in conserving and promoting the health of the civilian population during and after the present war.

Resolved, That this Association recommend that all local, state and provincial health departments be coördinated with the federal authorities during the period of the war, by the appointment of local, state and provincial health officers, where practicable as officers in the United States Public Health Service, or in the Provincial Health Service respectively as Reserve Officers; and that, if the authority of Congress, or of the Provinces is needed to permit such appointment of officers, this Association respectfully urges Congress and the provincial legislatures to pass such enabling bills as will permit the proper federal and provincial authorities to make such appointments and to undertake such plan of coördination.

Approved by the Committee on Resolutions October 18, 1917, and presented at general session at 8 P. M. on the same day by the chairman, H. Emerson.

Addresses were delivered by Surgeon-General W. C. Gorgas, U. S. A., Surgeon-General W. C. Braisted, U. S. N., and Assistant Surgeon-General J. W. Trask, U. S. P. H. S.

Captain J. Gilmore read a paper for Col. T. W. Goodwin, "The Preservation of the Health of the Soldier on the Western Front."

Dr. Simon Baruch demonstrated certain toilet devices for use in trenches.

The meeting then adjourned to the upper floor to visit the art gallery of the New National Museum and to listen to a concert by the Marine Band.

THIRD GENERAL SESSION, OCTOBER 19, 1917, 9 A. M., NEW WILLARD HOTEL.

Called to order by Dr. Donald B. Armstrong, Chairman of the Sociological Section.

The following papers were presented:

Tuberculosis and the War, by Dr. Otto Eichel.

Venereal Diseases and the War, by Surgeon-General Gorgas.

Contagious Diseases in the War, by Surgeon-Major Edward Rist.

Rehabilitation of Diseased and Injured Soldiers Due to the War, by Major Elliott Brackett.

War and the Food Problem, by Herbert C. Hoover.

Adjournment.

FOURTH GENERAL SESSION, OCTOBER 19, 1917, 8 P. M., NEW NATIONAL MUSEUM.

Called to order by President Evans.

The following resolutions were presented by the Resolutions Committee, and adopted by the Association:

RESOLUTION

Resolved, That the thanks of the American Public Health Association be extended to the American Red Cross for its establishment of a Bureau of Sanitary Service for the purpose of assisting the various health authorities in the maintenance of effective sanitary control of the communities adjacent to cantonments, and other important military establishments; and

Resolved, That the American Public Health Association hereby pledges itself to coöperate fully and heartily, whenever desired, with said bureau, and all other activities of the Red Cross, for the conservation and promotion of the public health.

RESOLUTION

Resolved, That the Section on Industrial Hygiene of the American Public Health Association offer the following resolution for the consideration of the Association and prays its adoption. That the National Council of Defense immediately have established under the United States Public Health Service a Bureau of Information that shall promote the installation of medical supervision in all plants employing 1,000 or more employees; furthermore.

Resolved, That all industries engaged in governmental contract work be required to institute such medical supervision; and finally

Resolved, That a copy of these resolutions be presented to the Council of National Defense.

The chair appointed the following committee to present to the President of the United States the resolution passed at the previous meeting, which related to the United States Public Health Service: Dr. E. G. Williams; Dr. Haven Emerson; Dr. A. R. Reynolds.

Dr. Rudolph Hering, on behalf of the Board of Directors presented the following report:

REPORT OF COMMITTEE ON CONSTITUTION.

The Board of Directors beg leave to report as follows on the amendment of the Constitution:

It is recommended that the constitution of the Association be amended so as to provide

First: For a Health Association to be formed in each of the United States, in the Dominion of Canada, the Republic of Mexico and the Republic of Cuba.

Second: For a Board of Directors composed of delegates from these Health Associations, in addition to the directors elected by the sections and the ex-president.

Third: For four Vice-Presidents—one from each county represented in the Association.

Fourth: For an Executive Committee of seven persons, composed as follows: the president, the secretary, the treasurer and four elective members whose terms of office shall be so arranged that one member shall drop off and his successor be elected each year. The term of each elective member to be four years.

The report was accepted with motion to consider at the next annual meeting.

The following papers were read:

The Red Cross Sanitary Service, by Dr. W. H. Frost.

Sanitation in Canadian Camps and Barracks, by Major J. W. S. McCullough.

War and Mental Diseases, by Major Pearce Bailey.

What the Soldier Fighting in France Should Know about Tuberculosis, by Dr. S. A. Knopf.

Adjourned.

FIFTH GENERAL SESSION, OCTOBER 20, 1917, 2 P. M., NEW WILLARD HOTEL.

Called to order by President Evans.

Doctor Sawyer reported nominations for officers of the Association, on behalf of the Advisory Council.

The following officers were unanimously elected to serve for the next year:

President, Dr. Chas. J. Hastings, Toronto, Ont. First Vice-President, Dr. Geo. M. Kober, Washington, D. C. Second Vice-President, Dr. Manuel S. Iglesias, Vera Cruz, Mex. Third Vice-President, Dr. G. H. Sumner, Des Moines, Ia. Treasurer, Dr. Lee K. Frankel, New York City.

On nomination of Doctor Sawyer, representing the Advisory Council, the following directors were elected for the ensuing three years:

Dr. John B. Anderson of Spokane to succeed Dr. Tuttle of Washington.

Dr. C. S. Caverly of Vermont to succeed himself.

Dr. P. M. Hall to succeed himself.

Dr. Frazer of Manitoba to succeed Dr. Bell of Manitoba.

Dr. Seymour to succeed Dr. Wood.

Dr. John Landis to succeed Dr. R. H. Bishop of Cleveland.

Dr. John Hurty to succeed Dr. Morgan of Indianapolis.

Dr. Galarreta of Cuba to succeed Dr. Agramonte of Cuba.

Dr. B. L. Arms of Florida to succeed Dr. Monjaras of Mexico.

Dr. McGurren of North Dakota to succeed Dr. Ladd of North Dakota.

Dr. J. T. Black was elected a director to succeed Dr. H. Conn, deceased; and Dr. P. S. Schenk was elected to succeed Dr. E. C. Levy, resigned.

Following the recommendation of the Advisory Council the Association unanimously elected Mr. Herbert C. Hoover, Food Administrator of the United States, to honorary membership in the Association.

The following resolutions were adopted:

RESOLUTION

Resolved, That the American Public Health Association express its appreciation and grateful acknowledgment to the Committee on Arrangements, the Reception Committee, and the Ladies' Entertainment Committee for their painstaking and thoughtful care for the needs and comfort of the Association;

Resolved Further, That the Secretary and Regents of the Smithsonian Institution and the managers of the New Willard and New Ebbitt Hotels and the Chamber of Commerce and its Secretary, Mr. Thomas Grant, be thanked for the facilities they placed at our disposal when a multitude of demands made their action on our behalf particularly difficult.

Resolved Further, That the devotion of the Chairman of the Committee on Arrangements, Dr. George M. Kober, be acknowledged by a rising vote of thanks.

RESOLUTION

Resolved, That it is the sense of the American Public Health Association that the Federal Bureau of Education should attempt to discover what is proper practice as to continuing or closing the schools as a means of controlling epidemics of measles, whooping-cough, scarlet fever, diphtheria, smallpox and poliomyelitis, and that they should publish their conclusions in the annual report of the Bureau and in bulletin form; and

Resolved Further, That a copy of this resolution be forwarded to Dr. P. P. Claxton, in charge of the Bureau.

RESOLUTION

WHEREAS, The American Public Health Association recognizes that in the field of science there have been no victories which have added more to the human needs and happiness than those of public health, and

WHEREAS, The wide sphere of action covered by the work of sanitarians often requires them to direct their energies into places of danger greater even than those of war; and

WHEREAS, The construction of the Panama Canal, one of the world events of recent years has been made possible through the triumphs of sanitary science, the chief exponent of which in that work was a member of long standing in this Association; therefore be it

Resolved, That this Association desires to bring this fact through the proper channels to the attention of the trustees of the Nobel Prize Fund with a view to having Dr. Wm. C. Gorgas, Surgeon-General of the United States Army, honored by bestowing upon him the Nobel Prize for the good work he has accomplished in placing yellow fever in the list of preventable diseases.

RESOLUTION

Resolved, That the cordial and hearty thanks of the American Public Health Association are tendered to Prof. Selskar M. Gunn, on account of his faithful and efficient services as Secretary of the Association, and as Editor of the JOURNAL, and it is the wish and hope of the Association that Professor Gunn will be successful in the work he is now doing for his country and human liberty, and that he will finally return safely in health, to again serve in the public health cause.

Resolved Further, That these resolutions be sent to Professor Gunn in France by the President of the Association.

Dr. Peter C. Bryce on behalf of the Committee on Necrology, reported as follows:

The Committee begs to report:

That the past year has seen the passing away of several most earnest and prominent members of the Association, amongst whom the names of Dr. H. B. Holton of Vermont and Professor H. W. Conn of Connecticut will be recalled. Doctor Holton as a treasurer, president and member of the Executive and Chairman of the Editorial Committee, long played an important part in promoting the highest scientific interests of the Association. Professor Conn, as a member of the oldest section of the Association, for many years added much to the practical work done under the Section of Chemistry and Bacteriology and was at the time of his sudden removal an active member of the Executive Committee of the Association, which felt the loss of so valuable a member.

To all friends of these members and of any others who are included in the list of deaths, the committee recommends

That the secretary be instructed to convey a copy of this report, with the expression of the regrets and sympathy of the members of the Association for them in their loss.

The Board of Directors then retired to transact business.

Résumés of section conferences on war problems and of section proceedings were presented as follows:

Dr. Henry Albert, Laboratory Section.

Dr. J. W. Trask, Vital Statistics Section.

Dr. D. B. Armstrong, Sociological Section.

Dr. Geo. M. Kober, Industrial Hygiene Section.

Mr. Lucius P. Brown, Food and Drugs Section.

Dr. E. C. Levy, Public Health Administration Section.

Dr. B. S. Warren announced for the Committee on Health Insurance that no report would be made, but recommended the continuance of a Committee on Health Insurance, since war conditions demonstrated the need of such measures.

The report was adopted.

By a rising vote, a resolution of thanks to the Ladies' Entertainment Committee was adopted.

After remarks by the officers for the coming year, the convention was adjourned.

W. A. EVANS,
President.
A. W. HEDRICH,
Acting Secretary.

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Errors in Death Registration.—That it is essential to increase the accuracy of death registration, is the opinion of Dr. A. R. Perry, of the United States Department of Labor, Bureau of Labor Statistics. In an investigation of errors in death registration in the industrial population of Fall River, Mass., Doctor Perry found that frequently the actual cause of death might be misstated; or that the secondary cause might be unrecorded; or that the decedent's occupation might be incorrectly given.

The actual misstatement of the cause of death occurred most numerously in cases where tuberculosis was the real though not the recorded cause of the disease, and also where death was really due to childbirth. It was found that 17 per cent. of all the fatal tuberculosis in the city was reported as due to nontubercular causes. Also that 26 per cent. of all the actual parturition fatalities were not properly reported. It is thus possible for some physicians through willful negligence or ignorance to retard progress in industrial hygiene and preventive medicine.

Association Closes Office for Duration of War.—The Association for the Prevention and Relief of Heart Disease has decided to discontinue its investigations and educational propaganda for the duration of the war, owing to the induction of the Executive Committee into various branches of service for the nation.

Medical Inspection in Schools of Great Britain.—In *Bulletin No. 49* of the Bureau of Education of the Department of the Interior, there is given a comprehensive view of the development and scope of medical inspection of school children in Great Britain. The report is written by E. L. Roberts.

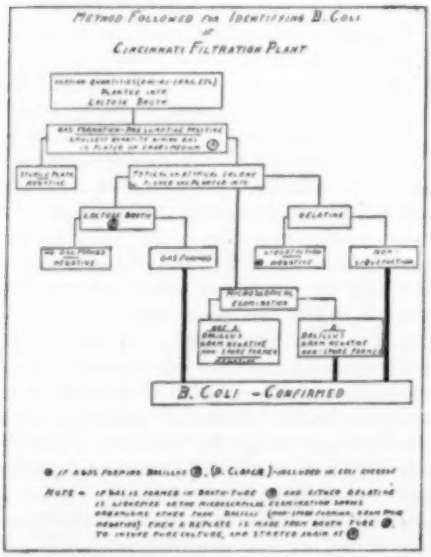
Medical inspection of school children is now compulsory throughout Great Britain. The work, however, was voluntarily begun in London in 1891. Later, 1893, Bradford, England, and in 1906, Dumfermline, Scotland, followed. In 1907, medical inspection was made compulsory in the schools of England and Wales, and in 1909 the same was done for Scotland.

The work is nominally in charge of the Board of Education, but the actual work and immediate supervision are conducted by medical officers, inspectors of physical training, school nurses, physicians and dentists. The work is varied. Every child is thoroughly examined and defective children are segregated from the rest and educated apart from the normal children. Special attention is also given to the blind, deaf, crippled, and incorrigible children. Eye and ear defects are noted and remedial measures are recommended. Specialists are employed on a part time basis for the treatment of eye, ear, nose, throat and skin diseases. Many dentists are employed both for inspection work and for treatment. Special attention is given to the feeding of necessitous children, as well as other children who desire a warm and wholesome midday lunch on the school premises at a minimum cost. Part of the work is the inspection of schools, and recommendations for improving old structures and for designing new ones. A report is made on the condition of the ventilating system. The nature of the desks and benches used by the children is studied. Inquiry is also made into the effectiveness of the lessons on personal hygiene that are taught in the schools. Open air classes are observed and carefully studied.

METHOD OF ISOLATING AND IDENTIFYING BACILLUS COLI USED AT THE CINCINNATI FILTRATION PLANT.

STEPHAN J. HAUSER,
Cincinnati, Ohio.

THE B. coli group may be defined as ærobic non-spore forming Gram-negative bacilli, fermenting lactose with production of gas, and not liquefying gelatine. At the Cincinnati Filtration Plant the attempt is made to carry out the examinations so that the above definition is fulfilled as completely as possible, consistent with the speed and facility necessitated by routine water analysis. The method followed is illustrated graphically by the accompanying chart and this paper



is primarily an amplification and discussion of the procedure therein contained.

The particular water samples under examination are planted into lactose broth. Lactose broth is used rather than lactose bile, which is the medium recommended in the 1912 edition of the Standard Methods of Water Analysis of the American Public Health Association, for the reason that, not only at this laboratory, but at the laboratory of the Ohio River Investigation of the United States Public Health Service and other laboratories, it has given consistently a higher percentage of confirmed end-results from original inoculations. In planting the water sample decimal dilutions are used to facilitate computations of the B. coli index. In routine examinations, at least three dilutions are used in order to obtain, if possible, a negative and a positive test. The formation of gas in any amount after forty-eight hours incubation at 37° C. is recorded as positive and considered as presumptive positive. The smallest quantity of water giving gas is then confirmed.

A loop-full of culture from the tube furnishing the presumptive test is stroked upon Endo's medium previously poured in plates. The plates are incubated at 37° C. for twenty-four hours. If no ærobic colonies (sterile plate) develop, the respective gas formation is considered due to anærobes, and B. coli is recorded as not present. If ærobic colonies develop, the most typical of B. coli is transplanted into lactose broth and gelatine and a microscopical examination made directly. As there are several varieties of typical B. coli colonies, experience alone will determine the choice.

If in the lactose broth transplant, no gas is formed after the forty-eight hours at

37° C., the result is considered negative, and B. coli is recorded as not present. If gas is formed the result is considered positive for B. coli, subject to the results of the gelatine transplant and a microscopical examination. If after forty-eight hours' incubation at 37° C. the gelatine transplant will solidify on cooling, the culture is considered as non-liquefying. If the gelatine does not solidify on cooling, and gas is formed in the lactose broth transplant and the microscopical examination demonstrates a bacillus, the organism is called B. cloacæ and included in the B. coli numerical estimation as it has the same sanitary significance.

The microscopical examination consists of a smear made according to the method of Gram from the Endo plate colony selected for transplanting. A Gram-negative non-spore forming bacillus obtained following the above procedure fulfills in every particular the definition for the Bacillus Coli. If other than a Gram-negative non-spore forming bacillus is obtained, it is not considered B. coli and is so recorded, but such a result is unlikely and has not been encountered in our experience. The liquefaction of gelatine and discordant results in the microscopical examination accompanying gas production in the lactose broth transplant are likely to be due to mixed cultures, in which case separation should be made by replating from the lactose broth transplant.

Estimation of the B. coli index is made according to Phelp's method, that is, the reciprocal of the smallest volume of water which gave a positive test is taken as the approximate number of B. coli per cc. and is recorded as such. In case of an anomaly it is assumed that the positive result should have been negative and the negative result positive and is so considered in obtaining the B. coli index. If a negative confirmation test is obtained, B. coli is considered present in the next larger quantity without confirmation. If a negative result is obtained from the largest quantity planted, either by no gas formation in the original planting or by a negative confirmation test, B. coli is considered present in the next larger amount that would have been planted except that a negative result in 100 cc. is recorded as zero. The assumption is valid only in the case of waters such as are encountered in water purification plants where the approximate coli content of the water is known. Such assumptions are rarely necessary as the quantities of water chosen for examination can ordinarily be changed in sufficient time to always obtain a positive test. It is probable that this assumption causes less error than would be introduced by either omitting the figure from the averages or calling it zero.

The laboratory work above described with the numerical estimations of B. coli derived are recorded for the month under the headings of waters in the consecutive stages of purification. The form used is convenient and compact and lends itself readily to a grasp of conditions throughout the plant at any time. Five days from the collection of the water sample, B. coli may, following the above scheme, be satisfactorily and conclusively isolated and identified to conform to the definition.

The following table will show the number of samples examined, according to this method, from January to October, 1916, and the percentage of samples confirmed as B. coli.

	River water.	Settled water.	Applied water.	Filtered water.	
				Effluent from filters.	Outlet clear water reservoir.
Samples tested	271	257	266	258	194
Percentage confirmed	97.4	91.0	96.6	94.9*	86.1*

* Includes one sample that showed B. cloacæ.

Book Reviews.

Handbook of Health in War and Peace. A Manual of Personal Preparedness. *By C.-E. A. Winslow, with a Foreword by Henry Fairfield Osborn. Department of Public Health and Public Education of the American Museum of Natural History. New York, 1917. Pp. 51. Paper 25 cents.*

This little handbook constitutes an admirable health guide, and contains a surprisingly large amount of practical information within small compass. The topics taken up include Food and Nutrition, Pure Foods and Clean Foods, Rest and Exercise, Posture, Fresh Air, Clothing, Bathing, Care of the Teeth, Drugs and Stimulants, Hygiene of Adult Life, Man and the Microbe, Disposal of Wastes, Insects and Disease, Spread of Disease, Immunity, Tuberculosis, Racial Health, Accidents and First Aid.

The material is well chosen, the presentation simple, clear and interesting. The booklet is certainly most helpful.

Charles F. Bolduan, M. D.

Preventive Medicine and Hygiene. *By Milton J. Rosenau, Professor of Preventive Medicine and Hygiene, Harvard University. Third Edition. D. Appleton and Co. New York, 1917. Cloth, $6.50.*

According to the preface, the present (third) edition of this well-known work might be called a "special" or military edition for it has been prepared to meet the needs of the present emergency. It contains a discussion of the Duties and Organization of the Sanitary Corps, the Examination of Recruits, Diseases of the Soldier, Sanitation of Troops in Camp and on the March; Sanitation of Barracks and Trenches, Physical Training, Personal Hygiene and Equipment of the Soldier, Red Cross, Rations, etc.

The new material is presented in the form of an added chapter, XIII, entitled "Military Hygiene," and embracing 120 pages. It is obvious that within this compass only a brief outline of the essentials of this important subject can be given. Nevertheless the author has admirably succeeded in condensing a large amount of useful material, and in doing so has apparently utilized the most recent sources of information available.

The book remains, as before, the most useful single work on the subject of preventive medicine and hygiene.

Charles F. Bolduan, M. D.

Notes on the Use of Pin Maps and Charts by Health Officers. *Gardner T. Swarts, Jr., C. E., Providence, R. I. Educational Exhibition Company, 1917. Illustrated. Price, 25 cents.*

This little pamphlet of 24 pages, essentially an advertisement for the Educational Exhibition Company's materials, is in fact a valuable guide in modern graphic methods. In its especial field of the use of pins, it supplements the larger standard statistical works, such as "Graphic Methods for Presenting Facts." No health officer can grasp the details of the incidence and distribution of epidemic diseases in relation to population, except through some graphic method of locating the cases. To this end spot maps have come into general use and they are valuable as permanent records that can be filed in small space.

The pin method with beads and other accessories, described in this booklet, is adopted to display a much greater variety of information on one map. From the quoted examples of use by various departments of health, the health official can readily get valuable pointers in adopting the method to his own requirements.

Herman R. Bundesen, M. D.

A Correction.

In an earlier issue of the JOURNAL we published a review of Parker's "City Milk Supply," in which the price was given as $1.50. We are informed by the publishers, McGraw-Hill Book Co., that the price is $5.00 net, and not $1.50.—EDITOR.

The Nation's Health. *Sir Malcolm Morris, K. C. V. O. New York: Funk & Wagnalls. 152 pp. Cloth, $1.25 net.*

This volume on the stamping out of venereal disease deals with a most important aspect of the nation's health, and one that has been brought into emphatic prominence by the war-conditions under which most of the nations at the present time are living.

Written by a member of the Royal Commission on Venereal Diseases of Great Britain, a member of the Executive Committee of the National Council for Combating Venereal Diseases, and, withal, one who has seen much of these diseases in a long professional career, it was bound to be scientifically accurate and authoritative. That it is also simple and direct in method and most readably clear in style enhances its value for the general public.

The symptoms of these diseases, their course and sequelæ, are set forth in phraseology which the laity can understand. Much that has heretofore been for the general public little more than medical terms to conjure with, such as the Wassermann test, the salvarsan treatment, neo-salvarsan and others, are here made plain for the uninitiated.

Some of the vital questions considered are indicated by some of the chapter-headings: The Prevalence, Distribution, and Economic Effects of Venereal Disease, Facilities for Diagnosis and Treatment, Should Venereal Diseases be Notifiable, The Policy of Regulation, The Urgency of the Question, etc.

Altogether, the book impresses one as a valuable adjunct in the vital work of awakening the general public to the need for the suppression of venereal diseases and the best way to go about it. *F. J. Osborne.*

Sanitation, Practically Applied. *H. B. Wood. New York, 1917. John Wiley & Sons. Pp. 463. Price, $3.00.*

Dr. Wood in this volume shows a remarkable appreciation of the relative importance and value of the different lines of work to be carried on by the health officer. Unfortunately, most writers on public health are too much under the spell of tradition and teach what has been done rather than what ought to be done. Not so the writer of this book, who, in the division of his subject, has thoughtfully apportioned his space according to the importance of the matters treated and has placed emphasis where it properly belongs. The chapter on contagious diseases is naturally the longest one. The more important diseases are taken up in turn and in a remarkably concise way the practical details of their control are touched upon. There are also chapters on vital statistics, food control, in which the distinction between economics, esthetics and health is kept clearly in mind, on milk, water, sewerage, industrial hygiene, insect carriers and on education, in the last of which it is insisted that the visiting nurse is more efficient for intensive education in unpromising quarters than is any other agency.

The book is written particularly for the health officer in the smaller municipalities and in the rural districts, though it is stated that it is intended also for laymen who are interested in promoting the health of their communities. Most books on public health are written from the standpoint of the administrator in a city of considerable size and it is fortunate that Dr. Wood has spoken more directly to those who are most in need of help and encouragement. Such officers will find this volume of the greatest value. The author has condensed a vast amount of detail into this book and in the main most successfully, particularly, when treating of the communicable diseases. Perhaps this has led at times to too dogmatic statements on matters concerning which there are still proper differences of opinion. *Chas. V. Chapin, M. D.*

Health Department Reports.

Prepared by A. D. Hiller.

Kenosha, Wisconsin.

The Annual Report of the Department of Health for the City of Kenosha is for the year ending April 30, 1917, and represents the first report under the new make-up of the department, to which staff has been added a chemist and bacteriologist, and a milk and food inspector.

We find out from the last line of the report that the population of this city is 31,576 and that the death-rate is 11.6 per 1,000 population—an excellent rate.

One thousand three hundred and ninety-five cases of contagious disease were reported.

Of the 76 cases of diphtheria, 13 died—too large a proportion. Doubtless this is due to the fact that free antitoxin is supplied neither by the state nor city, and too often the size of the administrated dose depends upon what the parents can afford—a deplorable condition, and neutralizing to a great extent the efforts of the Health Department.

Only two deaths resulted from the 41 cases of scarlet fever, which, according to the report "should be called scarlatina, as this is its proper name."

There were reported 979 cases of measles—"This much dread (by health workers) disease (and so little dreaded by many parents)." There were five deaths.

It is felt that much of the spread of contagious diseases will be curtailed with the completion of the isolation hospital, for the construction of which $20,000 has been appropriated.

Physical examinations of school children have been extended to the parochial schools, and now all children with the exception of the high school children are being examined.

A sanitary survey of the city is being made and so far has shown the presence of many unsuspected surface toilets—which are being eliminated.

In the report of the chemist and bacteriologist it is shown that the work and scope of work of the laboratory has greatly increased. It is, however, strange that in a city of this size, only 63 chemical analyses of milk and 60 bacteriological analyses should have been made.

Chief among the recommendations is that of a system of municipal collection of garbage, the passage of a modern milk ordinance, the establishing and maintenance of health and dental clinics for the poor children of the city, and the increase in the nursing staff in order to more readily check up on the contagious disease reports.

Mobile, Alabama.

The report of the activities of the Health Department of Mobile for the year ending December 30, 1916, is contained in the Report of the Board of Commissioners for that city.

Mobile has an estimated population of 60,000, nearly half of which is colored. The birth-rate per 1,000 population is reported as 17.8. Since the Alabama State Board of Health assumes that the lowest average birth-rate in the state is 25 per 1,000 population, it seems probable that Mobile does not have complete birth reporting.

There were 1,097 deaths reported in Mobile giving a general death-rate of 18.2 per 1,000 inhabitants. The colored death-rate was nearly twice the white rate, the former being 24.0, the latter, 13.8. Tuberculosis (all forms) was the chief cause of death with 143 deaths attributable to it. Bright's disease was next of importance with 131 deaths. Pellagra caused 46 deaths, a decrease of 11 deaths from the previous year.

Sixty-three cases of typhoid fever were reported, 50 white and 13 colored people were affected. Fifteen deaths resulted, giving a death-rate per 100,000 of 24.9. The rate, exclusive of non-residents, however, would be 14.9, a much better showing. There were reported two cases each of scarlet fever and diphtheria, no deaths resulting from the former and one death from the latter—a good record.

Two years have elapsed now without a case of smallpox for this city, though naturally the department does not cease to warn the people and to urge vaccination. Ten cases and one death were reported for infantile paralysis.

General sanitation is well maintained by the house-to-house inspection method. Mosquito breeding-places are being abolished, garbage containers are kept tightly covered, and open privies, on account of the extended sewer system, are disappearing.

In the laboratory nearly 4,000 examinations were made and the findings are well reported.

Deaths from all causes under 1 year of age numbered 110, 37 white and 73 colored, giving a rate, excluding still births, of 102.8 per 1,000 births. There were 35 deaths, under two years, due to diarrhœa and enteritis.

The report is well prepared and satisfactory. The work seems thorough and the rates reported, particularly for the whole population, are excellent.

Public Health Notes.

Abstracted by M. P. Horowitz.

The Health of United States Soldiers.—According to the *Official Bulletin* for November 7, 1917, Col. W. P. Chamberlain who has recently visited many Regular Army, National Army and aviation camps, reports that the health of the soldiers is exceptionally good. The percentage of sick varies from 1 to 2 per cent. At Camp Pike the rate was higher, due to an epidemic of measles. The most serious disease found in the camps was pneumonia. The latest type of serum treatment is being used for the disease.

Each National Army camp is provided with a 1,000 bed hospital and adequate facilities for operations, X-ray, laboratories and diet kitchens. Great precautions have been taken to procure a safe water supply and to satisfactorily dispose of the sewage.

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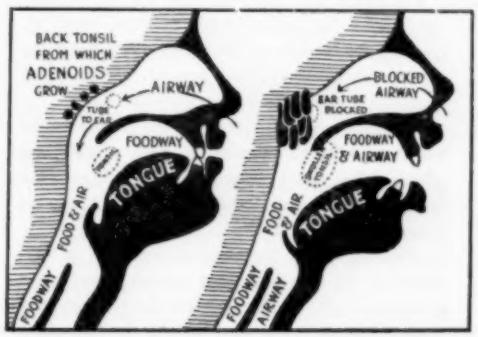
The following illustrations with comments are taken from an excellent booklet entitled "The Baby," and are reprinted by courtesy of the Massachusetts Department of Health.

Home-made Ice Box.—An ice box, as illustrated, can be made at home. Procure a wooden box about 18 inches square; put a layer of sawdust 3 inches thick in the bottom of the box; fill in with sawdust around a 10-quart tin pail. Around this pail a cardboard collar may be used to keep the sawdust in place. It is a good thing to put a layer of cheesecloth over the surface of the sawdust. Inside this pail place another smaller pail. If desired, the ice may be kept in the inner pail and the bottles placed in the larger pail. The pail should be securely covered and a bag of sawdust placed over it. The outer box should be tightly closed by a wooden cover lined with several thicknesses of newspaper. The inner pail should be taken out and cleaned every morning.

SAWDUST PACKING CASE

Warm the milk again before feeding. Never keep the feeding bottle warm all night, as the germs will ferment the milk and will make the baby sick.

Adenoids and Enlarged Tonsils.—A baby suffering from adenoids sleeps with mouth open, snuffles and cannot breathe freely. All babies who show any signs of trouble of this kind should



be examined by a good physician, as later the same cause may lead to deafness and other defects which seriously hinder the child's growth, both of body and mind.

Protect the baby from your cold.

Soothing syrups or paregoric will not help the baby to cut teeth and are dangerous to use.

Universal Military Training.—The following resolution was adopted unanimously by the Clinical Congress of Surgeons of North America at Chicago, October 25, 1917:

WHEREAS, The experiences of the nation convince us of the necessity for universal military training, to furnish qualified men for defense, to strengthen manhood and mental poise, and to make for a more efficient citizenship, and

WHEREAS, We believe it will democratize youth and furnish discipline, while developing physical force and endurance, and will produce better fathers and workers for the ranks of peace; therefore, be it

Resolved, That the Clinical Congress of Surgeons at its eighth annual session urges upon Congress at its coming session the passage of a measure along the general lines of the Chamberlain Bill for Universal Military Training, and that the cantonments now used by the National Army be utilized, if possible, for such work.

"Graphic Exhibits on Food Conservation at Fairs and Expositions" is the name of an attractive booklet issued by the United States Food Administration. The chapters have the following titles: Introductory; Save the Wheat; Economy in the Use of Fats; Other Food Exhibits; Food and War Facts; Appendix. The booklet is well illustrated, and might well serve as a model for health officers.

A New Anæsthetic.—A new anæsthetic is apparently being used with much success on the European battlefront. It is used particularly to relieve pain in exposed surfaces of wounds. The anæsthetic is called nikalgin, and is composed of quinine, hydrochloric acid, and urea.—*The Boston Medical and Surgical Journal*, October 25, 1917.

A Sanitary Privy System for Unsewered Towns and Villages.—Surgeon L. L. Lumsden, in *Public Health Bulletin No. 89*, of the United States Public Health Service, outlines a plan for the satisfactory disposal of fecal material from unsewered towns and villages. The recommendations are the result of investigations carried on throughout the country during 1914, 1915, and 1916. A sanitary privy system is suggested, consisting of water tight, cylindrical galvanized iron cans, 15 inches high and 15 inches in diameter. Each can is provided with a well fitting cover, and is placed in a privy house, which is thoroughly protected against flies, and which is ventilated by means of a flue pipe. It is estimated that one can is required for every group of five persons or less, and that the can should be replaced with a fresh one every seventh day. The plan is to have a scavenger service, which will collect the full cans, replace them with clean fresh ones, and dispose of the excreta. The method of disposal may be either by dumping into a sewer or by burial in the earth. In any case the can is washed and cleaned, dipped in a disinfecting solution and when replaced must contain about a pint of the disinfectant. It is desirable that the scavenger service should be operated under the direction of the municipal authorities. It is estimated that a charge of $3 to $4 per privy per year will insure a safe margin of profit.

Association News.

Rivers and Waterways Association Amalgamates with American Public Health Association.—Negotiations have for a number of months been under way to affiliate the National Association for Preventing the Polluting of Rivers and Waterways with the American Public Health Association. The work of the first named organization is closely related to that of the Sanitary Engineering Section of the American Public Health Association; in fact, a large proportion of the members are also members of the American Public Health Association.

The proposed merger was endorsed by the Sanitary Engineering Section at the Washington, D. C., meetings, and the final step toward affiliation was taken by the Executive Committee of the American Public Health Association, which on November 22 voted to accept the proposition of the Rivers and Waterways organization.

There were, last year, about twenty members in the National Association for Preventing the Pollution of Rivers and Waterways.

As was stated by Mr. H. deB. Parsons, Secretary of this Association, a few strong associations are better than a number of small ones.

In union there is strength. We are glad to welcome the Rivers and Waterways people, and hope that other of the smaller sanitary societies will follow their example.

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Health Employment Bureau.—Owing to the changes in occupation occasioned by the war, all registrants in the Health Employment Bureau have been asked to register anew. Health officers, sanitary engineers, medical inspectors, bacteriologists, chemists, sanitary inspectors, statisticians, teachers, etc., are invited to register. Registration is free to members. Lists of applicants are furnished to prospective employers free of charge.

An improvement has been made in the filing system, so that lists can usually be sent out on the same day the request is received. *In writing for names, please state the nature of the position, and especially the salary and the qualifications demanded, such as the M. D. certificate in public health, etc.*

Teachers in public health and medical schools are urged to call this service to the attention of their students.

Another item relative to health employment is to be found in the Public Health Notes Section.

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Executive Committee Meets.—On November 22, the Executive Committee of the American Public Health Association meet in New York City to consider the plans of the Association for the coming year. Those present were: President, Dr. Chas. J. Hastings; Treasurer, Dr. Lee K. Frankel; Secretary, A. W. Hedrich; Dr. W. A. Evans and Dr. Peter H. Bryce.

Inasmuch as the development of the Association and the JOURNAL hinges primarily upon the funds available, questions of finance formed a large part of the discussions of the meeting. The following measures are to be adopted for increasing the revenue of the Association:

1. Beginning January 1, 1918, the subscription price of the JOURNAL will be $4.00 per year, instead of $3.00, as heretofore.

2. There will be a campaign for corporate memberships at from $50 per year upward. Life insurance companies are considered especially favorable prospects for membership, since they benefit greatly from lowered death-rates brought about by public health activities which are promoted by the Association.

A committee on corporate memberships has been appointed, consisting of Doctors Hastings, Evans and Frankel. Early in December, the committee will appear before a meeting of the Association of Life Insurance Presidents to explain the work of the American Public Health Association.

One pledge of $1,000 per year has already been made, subject to the proviso that other companies join in taking out corporate memberships.

3. Dr. Evans and Mr. Hedrich were appointed a committee to increase the sale of advertising in the JOURNAL. The advice of experts is that the advertising of the JOURNAL could be made a profitable source of revenue from high-class advertisers. The potential gain from this source probably equals the profit from about 2,000 additional memberships.

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30. Cuba 5.0
29. Mexico 0.4
A.P.H.A.
Directorship Numbers, Area Included, and Number of Members on Sept. 30, 1917, per Million Population, (1910 Census)

It is of the greatest importance that members of the Association favor advertisers whenever possible by giving them an opportunity to bid for supplies, and, other things being equal, by patronizing the advertiser. The least that any member can do is to read the advertisements, and to invariably mention the JOURNAL when writing for supplies.

Already, more than ten pages of new advertising per month have been sold.

4. A campaign for new individual memberships will soon be undertaken in coöperation with the directors and members of the Association. The chart reproduced herewith shows the number of memberships per million population in each of the directorship districts. It is evident that there is great opportunity for expansion in the South, the Middle West, and the Far West. In districts 11 and 23 for example, comprising Kentucky, Tennessee, Louisiana, Arkansas, Oklahoma and Texas, the membership rate is only a fifth that of Connecticut, Massachusetts, Rhode Island, and New York.

How does your district stand?

The Next Meeting Place of the American Public Health Association.—This question has not yet been definitely settled. It was decided by the Executive Committee to hold the matter in abeyance until the next meeting of the Committee, to be held in the early spring, when it would be easier to gauge conditions associated with the war.

Personal Notes.

Prof. S. M. Gunn, until recently Secretary-Editor for the American Public Health Association, writes from Paris, France, that the work of the Tuberculosis Commission of the International Health Board, of which he is Associate Director, is progressing nicely. Films and exhibits are now ready for traveling. Recently the members of the Commission, including Dr. Livingston Farrand, Mr. Homer Folks, Dr. J. A. Miller and Prof. S. M. Gunn, were received by President Poincaré, who expressed the appreciation of the French people for the assistance rendered to bleeding France by America. The address of the Commission is 218, Rue de Rivoli, Paris, France.

Dr. Gustav F. Ruediger has resigned as the Director of the Hygienic Institute for La Salle, Oglesby and Peru, Ill. He is succeeded by Dr. Carl F. Raver, formerly of Aberdeen, S. D.

Prof. Burt L. Rickards headed a long list of competitors in the Civil Service examinations for the post of Assistant Deputy Commissioner of the State Board of Health of New York, and has been appointed to that position.—*Boston Med. & Surg. Jour.*

Prof. W. Lee Lewis of Northwestern University, Evanston, Ill., has been commissioned Captain, Officers Reserve Corps, to do work relating to gases in offensive work.

Mr. Homer I. Huntington has entered the United States Public Health Service, taking part in the dairy sanitation work at Camp Pike, Ark.

Mr. N. A. Nelson, formerly of New Castle, has through the medium of the Health Employment Bureau of the Association, been appointed Assistant Superintendent of the Cincinnati Anti-Tuberculosis League. Mr. Nelson says: "I will always be an enthusiastic 'booster' for the Employment Bureau."

Mr. Malcolm Lewis, formerly Joint Health Officer to Millburn and South Orange townships, N. J., is now Epidemiologist to the State Board of Health of New Jersey.

Mr. Albert H. Jewell, of Lansing, Mich., has been commissioned 1st Lieutenant, Sanitary Reserve Corps, and is stationed at the Signal Aviation School, Mt. Clemens, Mich. He is in charge of water purification, sewage disposal, garbage collection and disposal, and inspection of barracks and mess halls.

Dr. Vernon Robbins is now Field Director of Sanitation, State Board of Health, Montgomery, Ala.

Dr. Gustav F. Ruediger, for the last three and a half years Director of the Hygienic Institute for LaSalle, Peru and Oglesby, Illinois, has resigned that position to become Director of the State Hygienic Laboratory of Nevada, University of Nevada, Reno.

Prof. Séverance Burrage, who was sent by the Red Cross to investigate sanitary conditions in Serbia, has returned to Boston.

Mr. H. R. Hamilton, research student at Massachusetts Institute of Technology, has been commissioned 1st Lieutenant, Army Sanitary Corps.

Mr. E. B. Johnson, of Newburyport, Mass., is at Montgomery, Ala., as Chief Sanitary Inspector of the American Red Cross.

Ill health has compelled Dr. W. H. Frost to temporarily give up his work as Director of the Sanitary Service Bureau of the American Red Cross. His place is at present being taken by Surgeon Paul Preble.

Mr. E. D. Reynolds is a bacteriologist of the Red Cross Sanitary Unit No. 14, at Fort Warren, Ga.

Mr. Paul F. Nichols, former Assistant Health Officer at Summit, N. J., is now stationed at Camp Devens, Mass.

Mr. T. J. Duffield, formerly Health Officer at Summit, N. J., is now 1st Lieutenant, Sanitary Corps, N. A., Base Hospital, Camp Lee, Va.

*

The following members have removed without giving us their new addresses. The Editor will be grateful for any information which you may be able to furnish.

Last known address:

Amyot, John A., M. D., 4 Laburmeń Avenue, Toronto, Ontario.

Baker, Mr. John, 539 Main Street, Stamford, Connecticut.

Bentley, D. B., M. D., Sarnia, Ontario.

Clore, Mr. Lex B., Marion Club, Indianapolis, Indiana.

Cooke, Lane B., M. D., care American Consul, Vera Cruz, Mexico.

Craft, Clarence C., M. D., Postou, South Carolina.

Diggett, Mr. E. W., Tallahassee, Florida.

Gillihan, Allen F., M. D., Oakland, California.

Halsey, William H., M. D., Washington, D. C.

Hidy, Klore Wm., M. D., 717 South Figueroa Street, Los Angeles, California.

Holdredge, Mr. Leigh I., 66 West 10th Street, New York City.

Jackson, Elmer C., M. D., 622 Fourth Avenue, Ashland, Wisconsin.

Law, Edwin Augustus, M. D., 71 Church Street, Bartow, Florida.

Lougee, Lester B., M. D., Marcella, New York.

Ludwig, Mr. Ernest, The Leader-News Building, Cleveland, Ohio.

*Mills, Mr. Dudley A., Channel Isle, Jersey, England.

Molloy, Daniel M., M. D., Marine Hospital, New Orleans, Louisiana.

Murphy, Mr. Lyman C., City Hall, Chicago, Illinois.

Nicol, Mr. Norman C., 17 Gramercy Park, New York City.

Platt, Mr. Philip S., 105 East 22nd Street, New York City.

Rahn, Prof. Otto, 1111 West Stoughton Street, Urbana, Illinois.

Reinochl, Mr. John Krause, Las Cascadas, Canal Zone.

*Russell, J. B., M. D., Glasgow, Scotland.

Sawyer, Mr. F. L., 158 Whitney Place, Buffalo, New York.

Seabright, Mr. John E., North Jefferson Street, Bellevue, Ohio.

Simpson, R. M., M. D., 702 Sterling Bank, Winnipeg, Manitoba.

Taylor, John R., M. D., 22 Prospect Avenue, Madison, Wisconsin.

Tvedt, Mr. H. S., 268 State Street, Boston, Massachusetts.

Ward, Mr. Herbert C., 379 Agnes Avenue, Detroit, Michigan.

Warriner, Mr. Carlos E., City Hall, Fort William, Ontario.

Williams, Jesse L., M. D., 415 St. James Building, Jacksonville, Florida.

Wilson, Mr. William H., 41 Broad Street, New York City.

*Honorary members.

✤

Elected to membership in the American Public Health Association:

O. J. Hallenbeck, Canandaigua, N. Y. Physician, Surgeon, Health Officer.

Ross Leonard Dobbin, Peterborough, Ontario, Canada. Civil Engineer.

Byron U. Richards, Pawtucket, R. I. Secretary State Board of Health.

Alexander C. Bulla, Winston-Salem, N. C. Health Officer.

Nelson Eugene Young, Williamsport, Pa. Former Health Officer.

Home Economics Department, Utah Agricultural College, Logan, Utah.

Edward James Tucker, Washington, D. C. Captain Sanitary Corps, U. S. N. A.

Alexander Monro Grier, Wilmington, Del. Sanitary Engineer and Health Officer.

James Frederick Rogers, New Haven, Conn. Teacher of Physiology and Hygiene, Practice of Medicine.

Charlotte Hoffman, R. N., Battle Creek, Mich. Public Health Nurse.

Alonzo Blauvelt, M. D., New York, N. Y. Assistant Sanitary Superintendent Department of Health.

Ross Leonard Layburn, Leavenworth, Kan. Bacteriologist for Red Cross Sanitary Unit No. 5.

Robert Rae Harkness, York Village, Me. Health Officer.

Grace Pearce Crosby, Danville, Ill. Veterinarian, Trained Nurse.

Eugene Hiram Paddock, Washington, D. C. Civil and Sanitary Engineer.

Walter G. Hudson, New York, N. Y. Physician.

Carl S. Miner, Glencoe, Ill. Consulting Chemist.

Emil J. Riederer, Wilmington, Del. Director Safety Division, Atlas Powder Co., Wilmington, Del.

Harry L. Eskew, Nashville, Tenn. Commissioner Food and Drugs, State of Tennessee.

Raymond Scott, Philadelphia, Pa. In charge of Workmen's Compensation.

Elmer V. McCollum, Baltimore, Md. Professor of Biochemistry, School of Hygiene and Public Health.

Laboratory Notes.

Abstracted by Dr. Arthur Lederer.

APPARATUS AND TECHNIQUE.

A Traveling Field Laboratory in New Jersey.—The article describes the field laboratory installed in a delivery wagon body on an automobile well equipped for milk and water analysis.—Anon, *Eng. Contr., 48, 107.*

✽

A New Illuminator for Microscopes.—The new device serves as a source of illumination for opaque subjects. A small circular tube-lamp surrounds the objective and is attached to a holder which is clamped to the microscope tube. In micro-photography the lamp has been used to good advantage.—A. Silverman, *Jour. Ind. Eng. Chem., 9, 971.*

✽

A Substitute for Gloves.—By mixing a solution of the condensation product of formaldehyde and phenol with a solution of cellulose-esters a product is obtained, provided the proper solvents are used, from which can be precipitated a durable, impermeable, sterile, and bactericidal covering for the hands. It has the trade name "manutect."—Anon, *Muenchen. med. Wechnschr., 63, 967.—Chem. Centralbl. 1916, II, 417.—Chem. Abstr., 11, 2685.*

✽

An Electrically Heated, Constant-Temperature Water Bath for Serologic Work.—An electrically heated and controlled bath has manifest advantages over any other kind. The illustration of the apparatus shows it to be neat and compact. It is manufactured by the Chicago Surgical and Electric Company.—Oscar A. Schultz, *Jour. Am. Med. Assn., 69, 1521.*

✽

CHEMISTRY.

A New Test for Chlorine in Drinking Water and Its Application for the Estimation of the Chlorine Present.—100 cc. of distilled water are placed in a Nessler tube, 1 cc. of 0.1 per cent. benzidine solution in 10 per cent. hydrochloric acid are added and the mixture allowed to stand five minutes. The blue color which develops changes rapidly to a bright yellow. The color is compared with a standard. O-tolidine may also be used, and in some cases is preferable. The method will detect 0.005 p. p. m. of chlorine.—R. L. Mackenzie Wallis, *Ind. Jour. Med. Research, 4, 797.*

✽

The Determination of Fat in Certain Milk Products.—A method for determining fat, including treatment of the samples, in such dairy products as ice cream, evaporated milk, malted, dried skim milk, and similar milk products, is described. The procedure is similar to that followed when using the well-known Babcock test, but in place of sulfuric acid, mixtures of glacial acetic, sulfuric and nitric acids are prescribed. The fat is separated and read in a Babcock bottle.—C. K. Francis and D. G. Morgan, *Oklahoma Agr. Exp. St. Bull., 114.—Jour. Ind. Eng. Chem., 9, 861.*

✽

Application of the Cryoscopic Method for Determining Added Water in Milk.—The freezing point figure of milk is the most important constant yet obtained and the safest basis upon which to draw conclusions as to the presence or absence of added water. The presence of 5 per cent. added water can be detected in the majority of cases. The presence of formaldehyde lowers the freezing point. The milk must be reasonably fresh. An increased acidity interferes with the accuracy of the test.—J. T. Keister, *Jour. Ind. Eng. Chem., 9, 862.*

✽

BACTERIOLOGY AND PATHOLOGY.

Antityphoid Vaccination and the Agglutination Test in Typhoid and Paratyphoid Fever.—In non-vaccinated individuals the agglutination test is of the greatest practical value for diagnosing infections caused by the bacilli of the typhoid group. In individuals, having been previously vaccinated against B. typhosus, the agglutination test is absolutely unable to confirm a clinical diagnosis of typhoid. In a case of clinically confirmed typhoid occurring in a previously vaccinated individual, the agglutination test has a practical diagnostic value whenever it shows a constant predominance of the agglutination titer for one of the paratyphoid germs. This,

however, is a rare finding. Blood culture is the only reliable method to ascertain whether a typhoid infection occurring in a vaccinated individual is due to B. typhosus or to one of the paratyphoid germs.—E. Rist, *Jour. Lab. and Clin. Med., 3, 1.*

✻

The Effect of the Natural Antisheep Hemolysin Content of Human Serum on Complement Fixation Tests.—Contrary to the results obtained by many students of serologic problems, the experiments show that the effect of natural antisheep hemolysin in the practical operation of the Wassermann test is negligible. In the case of the gonococcus complement fixation test, it would seem to be advisable to absorb the natural hemolysin from sera showing a very great excess, since stronger specific fixations have in some instances been obtained with sera treated by this method.—Anna I. van Saun, *Jour. Lab. and Clin. Med., 3, 59.*

✻

The Wassermann Reaction with Large Amounts of Patient's Serum.—The use of large amounts of serum as recommended by Kromayer did not change a serum giving a negative result to one giving a positive if a double serum control (0.8 cc.) has been used, and the result of the test read only when this control was completely hemolyzed. Since large amounts of serum may of themselves bind complement without the addition of a Wassermann antigen, Kromayer's modification of employing large amounts of patient's serum is not considered safe.—Ann I. van Saun, *Jour. Lab. and Clin. Med., 3, 61.*

✻

The Use of a Vegetable Bouillon as a Culture Medium.—The following broth may be used as a substitute for the ordinary meat infusion: Water, 4 liters; potato, 300 grams; carrots, 150 grams; turnips, 150 grams.

Peel the potatoes, and wash the carrots and turnips, cut them all into small pieces and place them into cold water. Boil for four hours, strain, and make up the three liters, titrate and render feebly alkali. Heat in the outer plate at 120° C. for one-half hour, allow to stand over night in the refrigerator, and filter through paper.—Albert Berthelot, *Compt. rend. Soc. de. biol. Par., 80, 131; Abstra. Bact., 1, 221.*

The Sensitiveness of Tubercle and Other Acid-fast Bacilli to Acids.—A very great difference was demonstrated between tubercle and other acid-fast bacilli in sensitiveness to both organic and inorganic acids. Tubercle bacilli were killed in 24 hours by 0.1 N acid, but could resist more dilute acids. Other acid-fast bacilli were killed in N/80 acid. No difference could be detected in sensitiveness between human and bovine bacilli.—A. E. Porter, *Jour. Hyg., 16, 66.*

✻

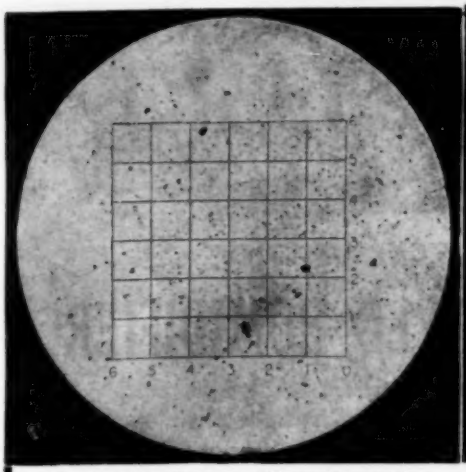
The Agglutination of the Diphtheria Bacillus.—With the use of a monovalent serum, two groups of the bacteria bacilli were distinguished, one of which is agglutinated, and the other not, although by the usual means of identification both are considered typical diphtheria bacilli. Clinically, the non-agglutinating organisms occur in mild infections and in bacilli carriers. —H. Langer, *Centralbl. f. Bakteriol., Part II, 78, 117.—Chem. Zentr., 1916, II, 413.—Chem. Abstr., 11, 2813.*

✻

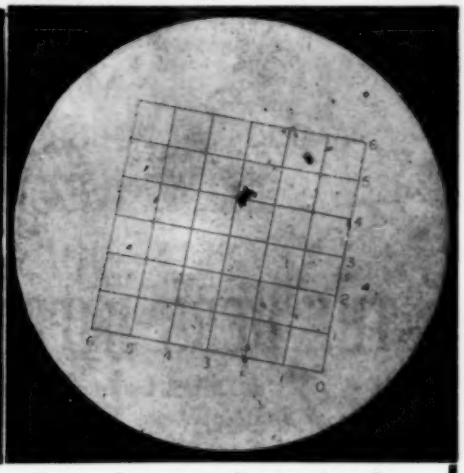
Acid-Fast Organisms in Distilled Water.—Distilled water may be divided into sterile, sterilized, clean and dirty water. Sterile distilled water is free from all bacterial bodies. Distilled water may be contaminated in the still, the tank or collecting bottle, and show different types of organisms including acid-fasts in most instances. The acid-fasts may or may not be morphologically like the tubercle bacillus. The larger the amount of sediment, and the older the water, the greater the number of acid-fasts. In perfectly clean, but non-sterile distilled water acid-fasts may appear after standing for a month. In all bacteriologic work it is advisable to use sterile distilled water collected in sterile containers.—R. A. Keilty, *Jour. Med. Research, 37, 183.—Jour. Am. Med. Assn., 69, 1200.*

✻

Examination of Feces With and Without Centrifugation.—The method of centrifugation increases the positive findings by 14 per cent. The method is most valuable in localities where intestinal parasites are not frequently found. —P. L. Querens, *Interstate Med. Jour., 24, 282; Bact. Abst., I, 223.*



Showing the Dust in a Chicago Street Car. (From an Official Test Made Before the Cars Were Equipped with UTILITY VENTILATORS



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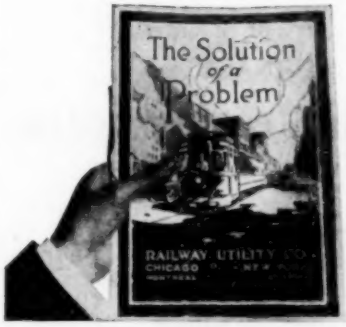
Chicago's Street Car Ventilating Problem and How It Was Solved



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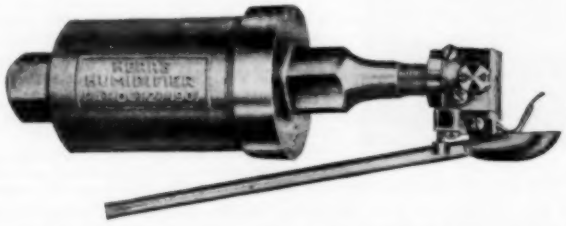

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American Journal of Public Health

Official Monthly Publication of the American Public Health Association

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DECEMBER, 1917

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It is *not* the policy of The DePree Chemical Company to make specific claims of efficiency for its fumigators. We do not assert that a particular size is efficient in a room of given size. Each laboratory is invited to determine its own standard. Fumigators are made in several different sizes; it is obvious that within the limitations of Formaldehyde any required degree of efficiency may be obtained by simply increasing either the size, or the number of units, of fumigators.

This policy has demonstrated to over three-fourths of the Municipal Health Departments of the United States and Canada that DePree's Formaldehyde Fumigator offers more efficiency per cost unit than the old fashioned methods of Formaldehyde disinfection.

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Mulford Antipneumococcic Serums

For the Specific Treatment of Lobar Pneumonia

Lobar pneumonia is caused chiefly by the pneumococcus, of which there are three different fixed types and a fourth group, including possibly twelve different types.

Types I and II are responsible for about 70 per cent of cases, with an average mortality, **without** serum treatment, of from **25 to 30 per cent. With** serum treatment the mortality of Type I has been reduced to from **5 to 8 per cent.**

Type III is responsible for from 10 to 15 per cent of cases, with a death rate of 50 per cent.

Group IV is responsible for from 15 to 20 per cent of cases. These usually follow a milder course, only 10 to 15 per cent resulting fatally.

Mulford Antipneumococcic Serum Polyvalent is highly protective against pneumonia caused by Type I, and contains antibodies against Types II and III.

The serum is tested and standardized by tests on mice; 1 c.c. must protect against 500,000 fatal doses of Type I cultures.

The polyvalent serum should be used immediately on diagnosis of lobar pneumonia where type determination is impossible.

The dose is from 50 to 100 mils (c.c.) intravenously, repeated about **every six** to eight hours until the patient successfully passes the crisis. Most cases will require 300 mils (c.c.) or more. It is safe to administer the serum intravenously in large and repeated doses. When the serum is injected intramuscularly, the results are slower and less effective.

Mulford Antipneumococcic Serums are furnished in packages containing syringes of 20 mils (c.c.) each, and in ampuls of 50 mils (c.c.) for intravenous injection.

Mulford Specific Agglutinating Pneumococcic Serums for laboratory diagnosis are furnished for each of the three types, in 10-mil (c.c.) ampuls sufficient for about 20 tests.

Mulford Pneumo-Serobacterin Mixed is an efficient prophylactic against lobar pneumonia. It is supplied in packages of four graduated syringes, A, B, C, D strength, and in syringes of D strength separately.

Syringe A 250 million killed sensitized bacteria
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Syringe D 2000 million killed sensitized bacteria

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Lobar Pneumonia

Successfully Treated with Type I Antipneumococcus Serum

(One-third of All Cases of Lobar Pneumonia are Type I Infection)

Without Serum Treatment	With Serum Treatment
10%	2%
of *all* cases die of Type I infection	of *all* cases die of Type I infection

THE work of Neufeld, Lister, Cole and others has shown that the pneumococci causing lobar pneumonia can be classified into several distinct groups: that 80% of the cases are due to infection with Types I, II, and III; and that one-third of the pneumonia cases are caused by Type I pneumococcus. It has been shown, experimentally and clinically, that immune serum against Type I infection is highly efficient; also that immune serums for the other Type infections do not produce such effective therapeutic results.

Major Nichols, in discussing the lobar pneumonia problem in the U. S. Army, says: "The death rate in Type I cases has been reduced from over 30% to 5%. This method of treatment has passed the experimental stage, and no patient with Type I infection who dies without the early intravenous administration of large doses of Type I serum can be said to have received the best treatment."

Lederle's Antipneumococcus Serum—Type I

is standardized by animal protection tests, according to the method outlined by Cole. It is marketed in special syringe packages containing 50 cc, thus facilitating the intravenous administration of the recommended doses of 100 to 200 cc. Every package bears the date of manufacture, thus insuring the physician against the use of serum of unknown age.

PRICE $5.00 per package of 50 cc.

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For preventive inoculation, Pneumococcus Vaccine containing the principal types of pneumococci has been suggested by Major Nichols in the U. S. Army.

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U. S. Bureau of Public Health

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New York

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TO

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of the

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THE Metropolitan Life Insurance Company invites physicians, public health and social workers to make use of its valuable collection of mortality statistics.

These statistics present rates for the principal causes of death among white and colored wage earners in the United States and Canada. The material covers over ten million individuals for each of the six years, 1911 to 1916. Death rates are available for each race and sex, and by age period.

The Company hopes in this way to aid in the study of disease and disability among wage earners. It desires to stimulate medical investigation and research. By offering these statistics to the medical profession and to public health and social workers, the Company expresses also its appreciation of the co-operation which it has received from physicians and others who have replied to inquiries and have given detailed information in thousands of cases. This assistance has helped to make the statistics more accurate and valuable.

The Company is ready to receive inquiries regarding the incidence of diseases or conditions causing death.

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Large doses should be employed for curative purposes. Many experienced clinicians recommend 5,000 units in mild cases; in moderate cases 10,000 units, and in severe cases 20,000 units.

The most favored method of administration in mild and moderate cases is the subcutaneous or intramuscular; in severe cases, resort is made to the intravenous route.

The advantages of ***Immunization*** against diphtheria are best shown by the records of the New York City Health Department—80,000 immunized with a morbidity of 0.2 per cent.

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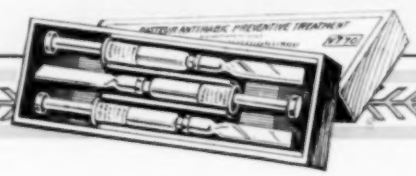

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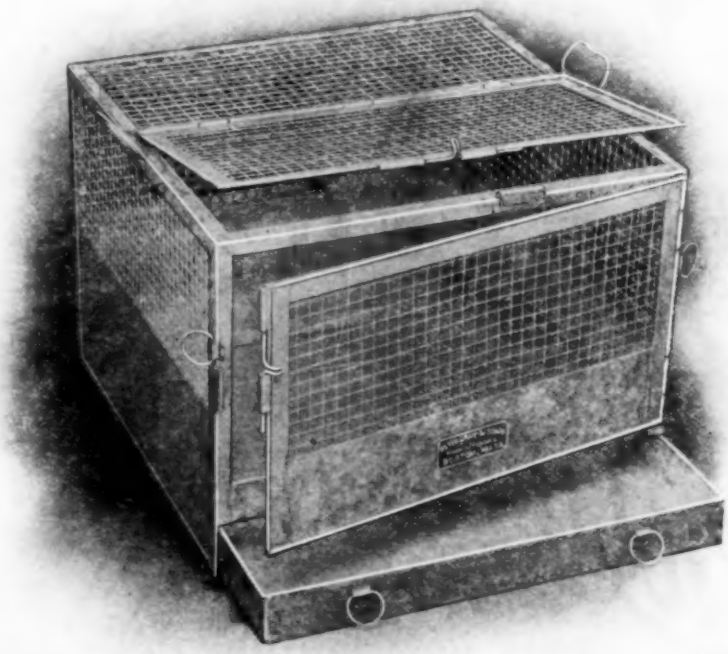

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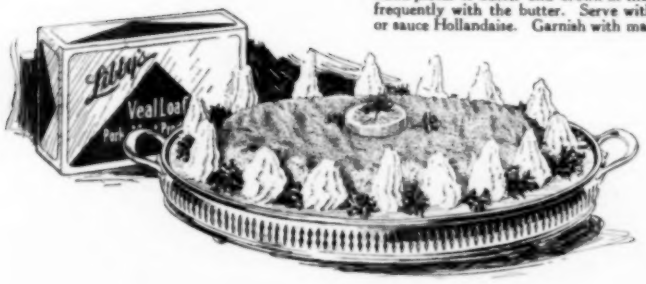

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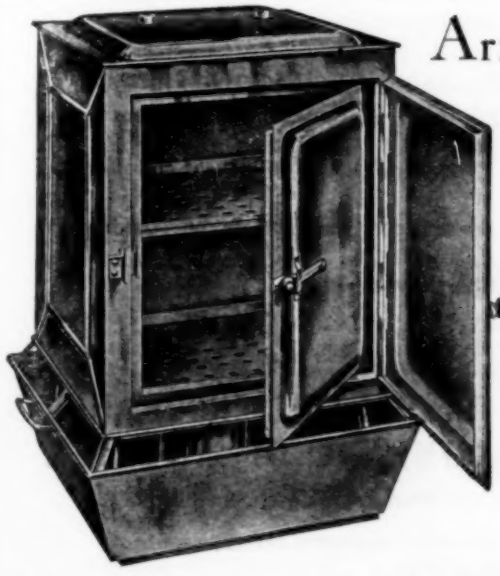

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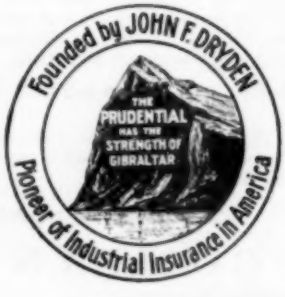

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"Arrah now, Bridget," said Norah, "an' there ye are wid another little Carr in yer arms."

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"Hookworm," said the native. "He's lazy."

"But," said the stranger, "I was not aware that the hookworm was painful."

" 'Taint," responded the garrulous native.

"Why, then," the stranger queried, "should the dog howl?"

"Lazy."

"But why does laziness make him howl?"

"Wal," said the Georgian, "that blame fool dawg is sittin' on a sand-bur, an' he's too tarnation lazy to get off, so he jes' sets thar an' howls 'cause it hurts."—*Journal American Medical Association.*

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Many a loved one gone before.
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Newark Evening News.—Journal American Medical Association.

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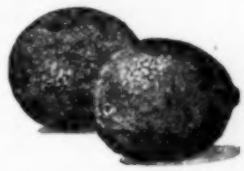

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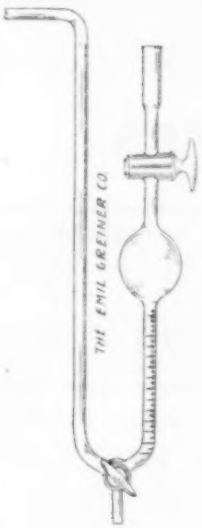

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